

Remedial Design Work Plan

Ground Water Treatment Interim Remedial Action

near

Tanks 53 and 56 at Tank Farm Five
Naval Education and Training Center
Newport, Rhode Island

1018

Submitted to:

Northern Division
Naval Facilities Engineering Command
Lester, Pennsylvania
Contract No. N62472-86-D-1282

Prepared by:

TRC Environmental Corporation
5 Waterside Crossing
Windsor, Connecticut 06095

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1.0 INTRODUCTION

This document is part of the interim remedial design process being conducted for the ground water operable unit at Tank Farm Five, Tanks 53 and 56, within the Naval Education and Training Center located in Newport, Rhode Island. These efforts are being conducted under Contract N62472-86-C-1282 for the NORTHNAVFACENGCOM. The Record of Decision for the site, which describes the selected interim remedial action for ground water remediation in the vicinity of Tanks 53 and 56 and provides the basis for this design, was signed by the U.S. Navy and the U.S. Environmental Protection Agency in September, 1992. It was based on the Remedial Investigation/Feasibility Study (RI/FS) and previous site investigation activities which have been completed at the site.

This document presents information pertaining to the conduct of additional site investigation activities required to support the design of interim remedial actions, as well as information pertaining to monitoring activities to be conducted during and/or following the design activities. It is organized in the following manner.

<u>Chapter</u>	<u>Contents</u>
1.0	Introduction and Background Information
2.0	Sampling and Analysis Plan
3.0	Health and Safety Plan
4.0	Detailed Statement of Applicable or Relevant and Appropriate Requirements (ARARs)
5.0	Preliminary Monitoring Plan
6.0	Draft Construction QA/QC Project Plan

1.1 NETC Description

The Naval Education and Training Center (NETC) is located within the Newport Naval Base which encompasses approximately six miles of the western shore of Aquidneck Island, Newport County, Rhode Island. Aquidneck Island is

comprised of three towns; Newport, Middletown, and Portsmouth. A map of the area is provided as Figure 1-1. The NETC serves as a training facility and provides logistic support for the Newport Naval Base. The NETC occupies approximately 1,063 acres of land. The location of Tank Farm Five within the Newport Naval Base is shown on Figure 1-2.

1.2 Previous NETC Investigations

Under the NACIP program, an Initial Assessment Study (IAS) was completed by Envirodyne Engineers in March 1983. The IAS identified sites where contamination from past waste disposal or handling practices may pose health or environmental risks. The IAS recommended further investigation at six of eighteen sites.

The Confirmation Study represented the second phase of the NACIP program. The Confirmation Study was completed in May 1986 by Loureiro Engineering Associates, Inc. It included on-site field investigations to confirm or deny the presence of contamination at two of the six subject study areas, based on recommendations of the IAS. Review of Confirmation Study results by the Navy and RIDEM provided a list of five sites to be addressed by a Phase I RI/FS Work Plan. Phase I RI investigations were completed at the five RI sites in 1991.

1.3 Tank Farm Five Site Description

The 85-acre Tank Farm Five (also referred to as Site 13) is the site of eleven underground storage tanks (USTs), which are numbered 49 through 59. Tanks 53 and 56 are located in the western portion of the Tank Farm Five site (see Figure 1-3). Each tank is constructed of prestressed concrete and has a capacity of 60,000 barrels (2.52 million gallons each). The tanks are

approximately 116 feet in diameter and 33 feet deep. Each tank is covered by approximately four feet of soil and is surrounded by a ring drain which consists of a 12-inch reinforced concrete drain pipe located within a permeable backfill approximately four feet wide. The drain is connected to a sump pump to remove ground water from the backfill area, thereby preventing tank damage or tank flotation.

A paved road provides access to the site, passing between the tank locations in a loop. Other facilities on-site include the recently constructed Fire Fighting Training Area, a small metal building which was used as an electrical substation, and a concrete structure apparently used as an oil-water separator. The Fire Fighting Training Area occupies approximately 3 acres in the northwest portion of the site and is surrounded by a chain-link fence. A brook, Gomes Brook, crosses the northeastern portion of the site, and discharges to the Narragansett Bay. Topography generally slopes to the north. The central portion of the site in which the tanks are located is gradually sloping and well-drained. During periods of heavy rainfall, runoff from the site was observed to accumulate at the point where Defense Highway crosses Gomes Brook. Ponded water was also observed in a marshy area in the eastern corner of the site. The site is vegetated with grass, brush and some trees. Tank Farm Five is bordered to the northwest by Defense Highway, to the southwest by a cemetery, to the east by residences and to the northeast by Greene's Lane.

The overburden materials at the site consist of a fill layer around the tanks and native sand and silt, glacial till. The till was encountered in all site borings, ranging in thickness from 1 to 21 feet. The till directly overlies bedrock which consists of gray, highly weathered to competent, slightly metamorphosed shale with quartz lenses. A considerable zone (up to 22 feet) of weathered bedrock overlies the competent bedrock.

Ground water flow direction for the shallow ground water at Tank Farm Five is generally to the west-northwest, towards Narragansett Bay in the southern portion of the site, including the area in which Tanks 53 and 56 are located. In the northern part of the site, ground water flow is to the north, towards Gomes Brook. Piezometer and surface water level measurements indicate that Gomes Brook is a gaining stream (receives discharge from the ground water). The hydraulic conductivity determined from slug tests performed on five wells screened in the shallow, weathered bedrock (with the exception of one well screened in till overburden) ranged from 0.16 to 0.21 ft/day. Horizontal hydraulic gradients in the shallow bedrock and till ranged from 0.0128 to 0.0398 ft/ft. Estimated average linear velocities for shallow ground water range from 0.017 to 0.05 ft/day. The contaminated ground water associated with Tanks 53 and 56 is not currently flowing toward residential areas and is not discharging to or impacting any surface water bodies. The nearest residential areas are located approximately 1400 feet to the north-northeast and 1200 feet to the east-southeast. The current State of Rhode Island ground water classification applicable to the site is class GA-NA. GA indicates ground water sources which may be suitable for public or private drinking water without treatment. NA indicates areas of non-attainment which are known or presumed to be out of compliance with the ground water standards of the assigned classification. The nearest body of surface water off-site is the east passage of the Narragansett Bay. A more complete description of the site can be found in the Remedial Investigation Report on pages 1-23 and 1-24 (TRC-EC, 1991).

1.4 History of Tanks 53 and 56, Tank Farm Five History

The USTs at Tank Farm Five were used for fuel storage from World War II to 1974. In 1975, the Navy began using Tanks 53 and 56 for used oil storage as

part of an oil recovery program. Between 1975 and 1982, Tanks 53 and 56 contained used oil for alternate use as heating fuel. In 1982, RIDEM adopted hazardous waste regulations which were applicable to the waste oils in Tanks 53 and 56. Sampling of the water, oil, and sludge in the tanks was conducted in 1983. The sample results indicated that the oil phase in both tanks was hazardous due to the presence of significant concentrations of lead. The sludge layer in both tanks was also determined to be hazardous due to the presence of significant concentrations of lead, cadmium, chromium, barium, mercury, and silver. In addition, the water in Tank 56 was found to contain petroleum hydrocarbon compounds. In 1985, results of ground water samples collected from monitoring wells installed in the ring drains of both tanks revealed the presence of several chlorinated and aromatic hydrocarbons and trace concentrations of mercury. Cadmium was also detected in one ground water sample from the ring drain of Tank 56. Subsequent investigatory activities conducted in 1986 confirmed the presence of organic compounds in the Tank 53 ring drain and in the ground water 150 feet downgradient of Tank 53.

On September 10, 1985, NETC was issued a Hazardous Waste Facility Permit by the RIDEM. In addition to permitting the two hazardous waste storage areas, the permit stated that Tanks 53 and 56 were to be removed and closed in accordance with hazardous waste regulations, as well as RIDEM requirements for underground storage tanks for oil and hazardous substances.

On November 21, 1989, NETC Newport was placed on the USEPA's National Priorities List (NPL).

1.5 Cleanup Activities to Date, Tanks 53 and 56

In January 1990, oil was observed leaking out of the gauging chamber of Tank 53 and onto the ground. Although the actual cause of the release was

unknown, it was suspected that it may have resulted from, or been compounded by, construction projects underway in Tank Farm Five close to Tank 53. RIDEM issued an Immediate Compliance Order which required the Navy to remove the contents of Tank 53, begin remediation of contaminated ground water and soils surrounding the tank, and initiate an investigation to determine the extent of oil contamination in the vicinity of Tanks 53 and 56.

In the spring of 1990, the Navy contracted with TRC Environmental Corporation (TRC-EC) to install additional monitoring wells and to collect soil, water, and tank content samples to determine the presence and extent of contamination in and around Tanks 53 and 56. The oil product samples contained high concentrations of chlorinated and aromatic hydrocarbons, base/neutral/acid extractable compounds (BNAs) and several metals. Water samples from both tanks contained detectable concentrations of chlorinated and aromatic hydrocarbons, semi-volatile organics, and several metals. Surface soil samples exhibited low concentrations of petroleum hydrocarbons and lead. Five soil boring samples contained detectable concentrations of both BNAs and petroleum hydrocarbons. Ground water sample results indicated the presence of floating hydrocarbon product and ground water contaminated with chlorinated and aromatic hydrocarbons and polynuclear aromatic hydrocarbons in the vicinity of Tank 53.

Pursuant to RIDEM tank closure requirements, the Navy contracted out and completed the removal of the sludge, oil and water layers from Tanks 53 and 56. After removal of the tanks' contents to an off-site facility for treatment, the tank walls were steam-cleaned to ensure that no contamination was left prior to tank demolition. Confirmatory samples (to verify steam cleaning operations) of concrete from inside the tanks were analyzed for Toxicity Characteristic Leaching Potential (TCLP) and were found to be below detection levels.

Several pumping wells were installed around these two tanks prior to removal of their contents to avoid tank damage and potential tank flotation due to hydrostatic pressure from adjacent ground water. A sump pump, activated by an increase in hydrostatic pressure, was installed to remove ground water from the ring drains around the tanks during periods of high ground water flow (e.g. heavy rainfall). An air stripping system with activated carbon was constructed to treat the tank's contents as well as the contaminated ground water as it was removed from around the tanks. Ground water pumped from the ring drains was transferred to another tank, prior to being discharged to the City of Newport Wastewater Treatment Facility.

Remediation of soil contamination around Tanks 53 and 56 is being addressed as part of the RCRA tank closure activities previously discussed. The complete closure of Tanks 53 and 56 (e.g. demolition and backfilling) will be postponed until additional information is obtained on the complete nature and extent of soil and ground water contamination around these two tanks, including the horizontal and vertical extent of soil contamination. A report of additional soil investigation activities conducted in the vicinity of Tanks 53 and 56 is currently being prepared. This information will be utilized to proceed with soil remediation in accordance with RIDEM's tank closure requirements.

1.6 Contaminant Characterization Summary

Six monitoring wells were installed during Remedial Investigations, supplementing seven wells previously installed on-site and the five wells installed during tank closure investigation activities. Volatile organic compounds (VOCs), base neutral/acid extractable (BNA) compounds, and inorganics were present in the ground water samples collected from wells

located near Tanks 53 and 56. VOCs were detected at levels exceeding Safe Drinking Water Act Maximum Contaminant Levels (MCLs) in wells located near Tank 53 and consisted mainly of petroleum-related VOCs. Petroleum product was also observed in wells MW-53W and MW-53E, both located in the ring drain of Tank 53. The presence of low VOC levels in downgradient well MW-4 indicates the potential migration of the ground water contamination from the area adjacent to Tank 53. BNAs were detected in wells near Tank 53, but no MCLs were exceeded. No pesticides nor PCBs were detected in the two ring-drain ground water samples submitted for PCB/pesticide analysis. While inorganic concentrations exceeded MCLs in all wells, including the background well, the highest levels of inorganic analytes were present in samples collected from wells in the central portion of the site.

1.7 Selected Interim Remedial Action

The interim remedial action addresses remediation of contaminated ground water near Tanks 53 and 56 through ground water extraction, treatment and discharge. The major components of the selected interim action include the following:

- Ground water extraction to contain contaminated ground water and prevent its migration and potential discharge to surface water bodies.
- Ground water treatment using coagulation/filtration and UV oxidation to treat organic and inorganic contaminants.
- Discharge of treated ground water to the local wastewater treatment facility.
- Continued ground water monitoring to confirm the capture of contaminated ground water.

1.8 Remedial Design Investigations Summary

To support remedial design activities associated with the development of the interim remedial action at Tanks 53 and 56, additional site investigation activities are required. These include the drilling of soil borings for geotechnical information or subsequent well installations, as well as the completion of a pump test to provide additional information on the hydrogeologic characteristics of the site. A limited number of ground water samples and soil samples will be collected for chemical or geotechnical analysis. Water supply flow tests will also be conducted to evaluate the availability of adequate water pressure to service the building housing the ground water treatment system.

2.0 SAMPLING AND ANALYSIS PLAN

The objective of this Sampling and Analysis Plan (SAP) is to present the scope of the remedial investigation activities to be conducted in support of the interim remedial design for the ground water operable unit at Tanks 53 and 56 of Tank Farm Five at the Naval Education and Training Center (NETC) in Newport, Rhode Island. The findings of these investigations shall provide supportive documentation necessary to design a ground water extraction, treatment and discharge system in accordance with the Record of Decision (ROD) for the interim remedial action.

The scope and rationale for geologic, hydrogeologic and supplemental investigation activities are presented in Sections 2.1 through 2.3. The described investigations have been developed to achieve the project-specific design objectives. The quality assurance/quality control procedures for the limited field sampling activities and associated laboratory analyses are presented in Section 2.4.

2.1 Geologic Investigation Scope

Geologic investigations will consist of the drilling of three soil borings for observation well and pumping well installations, as well as the drilling of five soil borings for geotechnical sampling required for the design of the treatment structure at the site.

Three soil borings will be completed adjacent to existing monitoring well MW-4, which is located near the leading edge of the contaminant plume, to allow for the conduct of a pumping test in this area. An additional five soil borings will be drilled to the south-southeast of Tank 53, under the proposed corner locations and in the center of the ground water treatment structure location, to provide geotechnical information needed in the design of the

structure. The pump test and geotechnical boring locations are presented in Figure 2-1. The proposed pumping well (PW-1) location is approximately 20 feet southwest of existing monitoring well MW-4. Observation well OW-1 will be located approximately 5 feet east-southeast of PW-1 while observation well OW-2 will be located approximately 25 feet east-southeast of PW-1.

Drilling and well construction activities will be subcontracted to a qualified well drilling firm. On-site drilling activities will be conducted under the supervision of a TRC-EC geologist/engineer. All boreholes will be advanced using 4-1/4 inch minimum inside diameter (I.D.) hollow-stem augers.

No subsurface soil sampling for laboratory analysis will be conducted during the soil boring activities but an organic vapor (OVA) and lower explosive limit (LEL) monitoring program will be implemented during the drilling program. The monitoring equipment will be calibrated each day prior to initiation of drilling activities, as further described in Section 2.6. The LEL will be used to monitor the breathing zone during subsurface investigations.

During drilling of the first observation well, split spoon soil samples will be collected at 5.0-foot intervals to a maximum depth of 50 feet or sampler refusal, whichever is encountered first, to define the lithology in the area in which the pump test will be conducted. Split spoon soil samples will be screened with an OVA immediately upon being opened. In drilling subsequent observation wells and the pumping well, the frequency of split spoon sampling and OVA monitoring will be determined based on field observations. The frequency of split spoon collection and OVA monitoring may be decreased if no detectable readings are observed during the first day of drilling.

During geotechnical soil borings in the corners of the proposed structure location, split spoon soil samples will be collected at 5.0-foot intervals, to a maximum depth of 20 feet. The boring located in the center of the proposed

structure location will be advanced to a depth of 5 feet. Split spoon soil samples will be screened with an OVA immediately upon being opened. A minimum 18-inch aliquot of each split spoon sample collected will be placed in a glass sample container for potential subsequent geotechnical analyses. Upon completion of the drilling program, one sample will be selected for California Bearing Ratio analysis, two samples will be selected for organic content analyses and two samples will be selected for grain size analyses. Typically organic content analyses will be conducted on near-surface soil samples while the bearing ratio and grain size analyses will be conducted on samples collected from the corner borings, closest to the depth of the proposed structure's footing (expected to be approximately at a depth of 5 feet). The selection of samples to be submitted for laboratory analysis will be made by the on-site TRC-EC geologist/engineer.

For both geotechnical and well installation borings, the physical characteristics of each soil sample will be geologically logged and generally described in a field notebook. General observations which may be described include staining, odors, or oily soils.

All drill cuttings from the geotechnical soil borings will be backfilled into their respective boring at the completion of the drilling activities at each location. The top of each boring location will be backfilled level to the ground with a cement bentonite slurry, as necessary. Observation/pumping well drill cuttings will be drummed and handled as described in the Investigation Derived Waste Plan, presented herein as Appendix A. Drill rig decontamination procedures are described in Section 2.4.4.

2.2 Hydrogeologic Water Investigation Scope

Hydrogeologic investigations will include the installation of two observation wells (referred to as OW-1 and OW-2) and one pumping well

(referred to as PW-1) in the vicinity of existing monitoring well MW-4 and the conduct of a pumping test to provide additional information for the assessment of the hydraulic performance of ground water extraction wells and the hydrogeologic characteristics of the aquifer.

2.2.1 Observation and Pumping Well Installation

Well construction specifications applicable to both the observation and pumping well include the following:

- Six-inch borehole (minimum);
- Two-inch inside diameter PVC riser and screen;
- Threaded or press joints only on PVC pipe (no glued joints);
- Silica (quartz) sand backfill to a minimum of two feet above the screened interval;
- Minimum two-foot thick bentonite seal above the sand pack;
- Portland cement/bentonite slurry (about 6:1 ratio respectively) in the well annulus from the top of the bentonite seal to the surface;
- All casing sealant and drilling fluids will be mixed with potable water;
- Vented well cap; and
- Steel casing with a locking cap will be securely set in cement over the well casing stick up and a minimum of three feet below the ground surface. Wells will be clearly numbered with a permanent identification system (e.g., metal tag) affixed to the well casing or concrete pad.

Each of the observation wells and the pumping well will be constructed with a 20-foot well screen. Riser lengths will be field-determined so the top of the casing extends approximately one to two feet above the ground surface. The driller and TRC-EC geologist/engineer will maintain accurate written logs of the well construction details.

2.2.2 Well Development

A suitable pumping device (e.g., submersible pump, WaterraTM hand pump) will be placed in each well and used for development. Equipment inserted into the well for development will either be dedicated to that well, or, at a

minimum, washed with non-phosphate detergent and tap water, rinsed with tap water followed by a deionized water rinse prior to each use. ASTM drinking water grade polyethylene tubing will be used for removing the water from the well. The polyethylene tubing will be replaced between each well. The dedicated new tubing will be rinsed with deionized water prior to its use. Water produced during well development will be drummed for characterization and analysis. An attempt will be made to develop each well until the extracted ground water appears to be visually clear, with a minimum development time of two hours.

2.2.3 Pump Test Procedures

The primary goal of the pump test at Tank Farm Five is to determine weathered/fractured bedrock aquifer characteristics such as transmissivity, specific yield and approximate radius of influence of the proposed extraction wells. This information will be gathered during a 24-hour constant-rate pump test at pumping well PW-1. The results will be used to determine the optimal extraction well spacing for capturing the ground water contamination plume associated with Tanks 53 and 56 at Tank Farm Five. A secondary goal is to determine the potential long-term sustainable yield from the proposed extraction wells.

First, the optimum sustainable long-term pumping rate of PW-1 will be determined by conducting a short-duration, step-drawdown test. The step-drawdown test involves increasing the pumpage from the well in successive steps or stages while recording the changes in water level in the pumped well. PW-1 will be pumped initially at a rate of 0.5 gpm for at least one hour. Each progressive step will increase or decrease the pumping rate by 0.25 to 0.5 gpm, with the revised rate sustained for at least one hour, if

possible. The incremental change in the pumping rate will be determined based on well development observations and field observations during the step-drawdown test. The pumping rate chosen for the pump test will be selected so as to not produce a drawdown greater than 45 feet below grade, because the submersible pump intake will be set at approximately 48 to 49 feet.

Prior to the pump test, one day of "background" static water level measurements will be collected at PW-1, as well as from existing monitoring well MW-4 and observation wells OW-1 and OW-2, which will serve as observation points during the constant-rate pump test. A sufficient amount of time will be allowed (12 to 24 hours) after the step-drawdown test has been completed for water levels to return to their static levels prior to initiating the "background" water level measurements. These measurements will determine trends in the static water levels (i.e., upward, downward or fluctuating) that can be incorporated into the pump test data interpretations. Background water level measurements will be collected at a minimum of once per hour. The measurements will be made automatically, using pressure transducers, and/or manually, using an electronic water level indicator.

After "background" measurements are complete, a 24-hour constant-rate pump test will be conducted on PW-1. PW-1 will be pumped at its pre-determined rate for a total of 24 hours, unless a steady-state (as defined by three hours of constant water level measurements) is reached within a shorter period of time, with the pumping rate not varying by more than 10% during the duration of the pump test. Water will be pumped from PW-1 using an electric-powered submersible pump with a pumping capability of at least 10 gpm. Power for the pump will be provided by a generator. Flow will be maintained at a constant rate with a gate valve attached to the discharge hose. Flow will be measured with an in-line flow meter and will be manually checked periodically by

time-volume measurements using a 55-gallon drum. Discharge from the pump test will be directed to Tank 52 (see Figure 1-3).

During the 24-hour pump test, water levels will be monitored in the pumping well and within the two newly installed observation wells and existing well MW-4. Well construction information for the proposed observation and pumping wells was previously provided in Section 2.2.1. Monitoring well MW-4, installed during the Phase II RI, is constructed of two-inch PVC and is screened from 16 to 31 feet.

During the pump test, the water levels at PW-1 and the observation wells will be monitored with pressure transducers; the pressure transducers to be used will be rated at a minimum of 15 psi for a minimum above-transducer water column capability of approximately 30 feet. The four pressure transducers will be attached to an automatic data logger with sufficient data storage capacity for the 24-hour pump test and a 12-hour recovery period. The water-level sampling interval will be programmed to be initially short at the start of the test, and will lengthen as the test progresses and a steady-state condition is approached. Confirmatory manual measurements will be made at the wells; PW-1 will be fitted with a one-inch diameter "drop tube" for the confirmatory measurements.

Following completion of the 24-hour pump test, the pump will be shut off and non-pumping, recovery measurements will be collected. Water level measurements of PW-1 and the observation wells will be recorded with the pressure transducers using the same sample interval schedule as that used for the pump test. Confirmatory manual measurements will be made during the recovery period. These measurements will proceed until there is a 90% recovery of all of the water levels from their original static level, or for a maximum period of 24 hours.

During the pump test and recovery period, "background" water levels will occasionally be measured at selected Tank Farm Five monitoring wells located within 500 feet of PW-1 but outside its anticipated radius of influence. Potential "background" monitoring wells include MW-7, MW-8, MW-9, MW-10, MW-86-2, MW-86-4 and MW-86-5. At least one TRC representative will be on-site during the entire duration of the test, with at least two TRC personnel on-site during the beginning and completion of the test.

2.2.4 Ground Water Sampling and Analysis

Ground water samples will be collected from pump test water discharge at three points during the pump test: at the initiation of the pump test, at the midway point during the pump test (12 hours) and at the end of the pump test (24 hours). These samples will be collected to provide additional ground water quality information near the leading edge of the contaminant plume and to provide additional information to be used in the treatment system design.

Ground water samples will be collected directly into the sample containers. This should be possible based on the low anticipated pumping rate to be used during the pump test. The samples will be analyzed for priority pollutant (PP) VOCs, BNAs, pesticides/PCBs, and inorganics, hardness, TDS, TSS, iron and manganese. These analyses will provide an indication of the quality of influent into the water treatment system.

The pH, specific conductance, temperature, dissolved oxygen, and redox potential of the ground water will be measured in the field immediately after sample collection. The pH, temperature, and redox potential will be measured using an Orion Model SA 230 meter, or equivalent. Specific conductance will be measured with a YSI Model 33 SCT meter, or equivalent. Dissolved oxygen will be measured with a YSI Model 51B Oxygen meter, or equivalent. Field

measurements will be recorded in a field notebook. Measurements of pH, specific conductance, temperature, dissolved oxygen, and redox potential will be made using approved EPA (SW-846, Third Edition) or Standard Methods protocols.

Ground water samples will be assigned a designated field identification number which will reference the site number, sample type, sample location number, and sampling date. Below is an example of a ground water sample identification number:

Ground Water Sample:

Example: TF5-PW1-01-012893

where:

TF5 = Tank Farm Five
PW1 = Pumping Well PW1 Water Sample
01 = Sample Number
012893 = Sampling Date (January 28, 1993)

2.2.5 Capture Zone Analysis

Data gathered during the pump test and recovery period will be collected and compiled by TRC in an orderly and manageable manner. The drawdown and recovery data will be downloaded into Lotus 1-2-3 compatible files, and will then be analyzed using the curve-fitting method developed by Neuman (1975) for anisotropic unconfined aquifers with delayed gravity response. Ideally, the pump test and recovery measurements will produce the following information:

- Sustainable Pumping Rate
- Radius of Influence
- Optimal Extraction Well Network Configuration for Capture of Ground Water Contamination Plume
- Aquifer Hydraulic Conductivity
- Aquifer Specific Yield

After the data files are transferred from the field, they will be downloaded, synthesized and interpreted. A draft report will be prepared and submitted for regulatory review and comment. The report will include results of field measurements (water discharge, elapsed time and water levels), time-drawdown curves and a summary of the results obtained. Conclusions and recommendations will be provided relative to the potential capture of contamination in the weathered/fractured bedrock aquifer.

2.3 Supplemental Activities Scope

Supplemental activities to be conducted under the Remedial Design Work Plan include a detailed site survey and the conduct of a water supply flow test. These activities are described briefly below. No sampling activities are associated with either of these tasks.

2.3.1 Site Land Survey

Following completion of the drilling activities at Tank Farm Five, the site will be surveyed by a State of Rhode Island registered surveyor. The physical site features along with the location, elevation, and coordinates of soil boring locations will be determined in the survey. Each sampling location will be referenced to the State of Rhode Island Grid Coordinate System. Completed wells will be surveyed for elevation of the top of the protective casing, top of the well casing and the adjacent land surface. All elevations will be referenced to the NETC benchmark (mean sea level - msl) and/or mean low water level (mlw).

2.3.2 Water Supply Flow Test

A water supply flow test will be conducted to measure static and residual pressure in the water supply system as a function of flow. This test will

allow for the evaluation of the ability of the existing water system to provide required fire flow with 20 psi residual pressure. Pressure will be measured at one fire hydrant located along Defense Highway, near the entrance to the Fire Fighting Training Center at Tank Farm Five. A second hydrant, located approximately 200 feet south of the proposed treatment building location, will be opened to measure flow and pressure. The water produced as a result of the test will be dissipated with a diffuser and discharged to the ground surface. If necessary, a stone splash pad will be provided to provide additional dissipation of the discharge.

2.4 Quality Assurance Project Plan

The Quality Assurance Project Plan (QAPP) serves as a controlling mechanism during field sampling to ensure data collected are valid and reliable. The QAPP outlines the organization, objectives, and QAPP activities which will ensure achievement of desired data quality goals.

A limited sampling program is included in the scope of site investigation activities associated with the interim remedial design. The sampling activities, sample matrices, and associated analyses are discussed in this Work Plan.

2.4.1 Project Organization and Responsibilities

This project will be largely performed by TRC-EC. Project review and oversight will be performed by Technical Review Committee members assembled by the Northern Division. The names and addresses of individuals involved in the review and oversight appear below.

- U.S. Navy

Northern Division
Naval Facilities Engineering Command
10 Industrial Highway
Mail Stop #82
Lester, PA 19113-2090
(215) 595-0567
Mr. James Briggs, P.E., Design Manager
Mr. Francisco LaGreca, P.E., Engineer-In-Charge

Naval Education and Training Center
Building 1, Public Works Department
Newport, RI 02841
(401) 841-3735
Ms. Rachel Marino, Environmental Coordinator

- TRC-EC

5 Waterside Crossing
Windsor, CT 06095
(203) 289-8631
Mr. Robert Smith, P.E., Program Manager
Mr. Carl Stopper, P.E., Project Manager
Mr. James Peronto, P.E., Technical Manager
Mr. Ronald Nault, P.E., Project Engineer

- Rhode Island DEM

291 Promenade Street
Providence, RI 02908
(401) 277-2797
Mr. Jeffrey Crawford, Mr. Paul Kulpa
Ms. Cynthia Signore

- U.S. EPA

Region I
Federal Facilities Section
90 Canal Street, 2nd Floor
Boston, MA 02203
(617) 573-5764
Mr. Carol Keating, Remedial Project Manager

The responsibilities of TRC-EC's Project Manager and QA/QC staff are briefly described below.

Program Manager's Responsibility

The TRC-EC Program Manager will provide senior review and direction to the project team. The Program Manager is responsible for ensuring the overall successful completion of the project.

Project Manager's Responsibility

The TRC-EC Project Manager will provide overall direction to the project team and will be responsible for the completion of the interim remedial design. The Project Manager will be the primary contact for the Northern Division's Engineer-In-Charge (EIC), Design Manager and the NETC Environmental Coordinator.

Technical Manager's Responsibility

The TRC-EC Technical Manager will provide technical assistance with respect to the completion of site investigation activities and design efforts, as needed.

QA Manager's Responsibility

TRC-EC's Corporate QA Manager will be the responsible Quality Assurance Officer for this project. The QA Manager reports independently to the Corporate President and, hence, has full authority to act independently from the technical line management structure. He will serve as TRC-EC's primary contact with the Northern Division's QA staff, if so requested by the EIC.

Field QC Coordinator's Responsibilities

A field team member will be assigned the responsibility of acting as Field QC Coordinator. As Field QC Coordinator, this team member will monitor preparations for the sampling events, and also the conduct of field work with respect to QC issues. He or she will be on-site to ensure required QC procedures are followed for sample collection and drilling; will initiate informal and/or formal corrective actions, as necessary; and will maintain and report QC records and results to the TRC-EC Project Manager and QA Manager.

The analytical laboratory selected for this project, a NEESA-approved, CLP laboratory, also is responsible for certain QC activities and will interact with the TRC-EC project team, as required. The duties of the laboratory with respect to QC include, at a minimum, the following:

- the proper preparation and shipment of sample containers;
- the analysis of environment samples in accordance with the associated EPA methodologies;
- complete record keeping and sample tracking activities.

2.4.2 Quality Assurance Objectives for Measurement Data

As mentioned previously, a limited sampling program is being conducted in association with the interim remedial design development. The overall quality assurance objective for laboratory analysis of the environmental samples is to provide chemical and geotechnical analyses and report analytical results in accordance with specified procedures and methodologies. Laboratory QA/QC requirements defined in analytical methods and protocol are designed to ensure that acceptable levels of data accuracy and precision are maintained throughout the analytical program.

2.4.3 Sample Collection, Handling and Shipping

Ground water is the only environmental matrix to be sampled for chemical analyses during the interim remedial investigation activities. Sample collection and monitoring procedures are discussed in Section 2.2.4 of this plan. These procedures will be implemented in order to collect representative samples which will provide reliable data for design purposes. All sample media collected will be handled in accordance with this QA/QC Plan. Analytical methods and estimated detection limits are described in Section 2.7 of this document.

It is important to use appropriate sample containers so that no chemical alteration occurs between the collection of samples in the field, and the receipt of samples at the laboratory. The sample bottles will be prepared and

shipped to the field by the laboratory. The sample bottles will be transported to the site within a sealed shipping cooler.

Sample containers will be selected to ensure compatibility with the potential contaminants and to minimize breakage during transportation. Aqueous phase samples for organic analyses will be contained in glass vials with teflon-lined, screw-type caps. Sample bottles, analytical methods and preservation required are listed in Table 2-1 for aqueous samples. Holding times are defined in Table 2-2, for the analytical methods listed in Table 2-1.

Sample labels will be filled out at the time of sampling and will be affixed to each container to identify the sample number, collector's name, date and time of collection, location of the sampling point, preservatives added, and analyses requested for sample.

After the bottles for a given sample site have been filled, they will be placed in a shipping cooler. Samples requiring preservation at 4°C will be covered with crushed ice in plastic bags or ice packs and placed in a separate cooler. Field personnel will provide crushed ice or ice packs to add to the shipping coolers as the samples are collected. Each sample container will be cushioned and sealed in a cooler container for shipment to the laboratory by overnight delivery.

A chain-of-custody record will be prepared and will accompany all samples to provide documentation of all samples collected and to trace sample possession. Chain-of-custody procedures are discussed in Section 2.5 of this document.

2.4.4 Field Decontamination Procedures

The drill rig will be steam cleaned and drilling equipment will be decontaminated prior to initiation of drilling activities. Drilling equipment

used for multiple boreholes will be decontaminated prior to each boring. Decontamination of drill rigs and drilling equipment (e.g., augers, rods) will be conducted at designated decontamination areas with a steam cleaner. Decontamination of sampling equipment will be performed in the laboratory and, if needed, in the field. Sampling equipment will be decontaminated using the following procedures:

- Wash and scrub with low phosphate detergent in tap water;
- Rinse with tap water;
- Rinse with 10% nitric acid (1% nitric acid on carbon steel split-spoons);
- Rinse with tap water;
- Rinse with hexane and methanol - pesticide grade solvents or better;
- Rinse with distilled water (demonstrated to be analyte-free);
- Air dry - on clean polyethylene sheeting; and
- Wrap in aluminum foil, shiny side out for transport (if not being used immediately).

NOTE: Clean equipment may rest on -- but never be wrapped in clean polyethylene sheeting.

All decontamination rinsates will be collected and contained in drums for subsequent characterization and disposal, as appropriate.

2.5 Sample Custody

Sample custody procedures will be observed to ensure the validity of the data generated during this sampling effort. Sample chain-of-custody will be initiated with the selection and preparation of the sample containers. To reduce the chance for error, the number of personnel handling samples will be restricted, and one person will be assigned the responsibility of field sample

custodian. On-site monitoring data will be controlled and entered daily in permanent log books, as appropriate. Field notebooks, sample label and chain-of-custody forms will also provide a means of monitoring sample custody, as described in the following sections.

2.5.1 Field Notebooks

The TRC-EC project manager will control field notebooks. Field notebooks will be bound books, preferably with consecutively numbered pages. Field notebooks will be maintained by the TRC-EC field team leader and other team members to provide a daily record of significant events, observations, and measurements during the field investigation. Notebook entries will be signed and dated.

All information pertinent to the field investigation will be recorded in the notebooks. Field notebook entries will include the following information (at a minimum):

- Name and address of field contact;
- Name and title of author, date and time of entry, and physical/environmental conditions during field activity;
- Names and titles of field crew;
- Names and titles of any site visitors;
- Type of sampling activity;
- Location of sampling activity;
- Description of sampling point(s);
- Date and time of sample collection;
- Sample media (e.g., ground water);
- Sample collection method;
- Number and volume of sample(s) collected;
- Analyses to be performed;
- Sample preservatives;
- Sample identification number(s);
- Field observations;
- Any field measurements made such as pH, temperature, conductivity, water level, etc.;
- Sample documentation such as:
 - bottle lot numbers,
 - dates and method of sample shipments, and
 - chain-of-custody record numbers

Original data recorded in the field notebooks, on sample labels, or in the chain-of-custody records will be written with waterproof ink. None of these documents will be destroyed or discarded, even if they are illegible or contain inaccuracies.

If an error is made on an accountable document assigned to an individual, that individual will make all corrections by crossing a line through the error and entering the correct information and initialing the cross-out. The erroneous information will not be obliterated. Any subsequent error discovered on an accountable document will be corrected, initialed, and dated, as appropriate.

2.5.2 Sample Labels

Samples obtained at the site will be placed in an appropriate sample container for preservation prior to shipment to the laboratory. Each sample will be individually identified with a separate identification label recorded with a unique sample identifier. The information recorded on the label will include:

- Project name/project number/location;
- Sample identifier/number;
- Source/location of sample;
- Analysis requested;
- Sample preservatives;
- Date of sample collection;
- Time of sample collection (a four-digit number indicating the 24-hour (military) clock time of collection; e.g., 1430 for 2:30 p.m.);
- Number of containers per analyte (i.e., 1 of 2, etc.); and
- Sampler's initials.

2.5.3 Custody Seals

Samples will be placed in containers sealed with custody seals prior to shipment to the laboratory. Clear adhesive tape will be placed over the seals to ensure that seals are not accidentally broken during shipment.

2.5.4 Chain-of-Custody Records

All samples collected for laboratory analyses will be accompanied by a chain-of-custody record, an example of which is shown on Figure 2-2. A chain-of-custody record will accompany the sample from initial sample container selection and preparation commencing at the laboratory, to the field for sample containment and preservation, and through its return to the laboratory.

The "Remarks" column in the chain-of-custody record will be used to record specific considerations associated with sample acquisition such as: sample type, container type, and sample preservation methods. When transferring samples, the individuals relinquishing and assuming sample custody will sign, date, and note the transfer time on the record.

A minimum of two copies of the chain-of-custody record will follow each sample to the laboratory. The laboratory will maintain one file copy, and the completed original will be returned to TRC-EC offices. A copy of the completed original will be returned as a part of the final analytical report. This record will be used to document sample custody transfer from the sampler, to another TRC-EC team member, to a shipper, or to the laboratory, and also to verify the date of sample receipt in the laboratory.

Shipments will be sent by overnight carrier with appropriate bill of lading documentation. Bills of lading will be retained as part of the permanent program documentation.

2.5.5 Laboratory Sample Custody

The TRC-EC Field QC Coordinator will notify the laboratory of scheduled field sampling activities and subsequent sample transfer to the laboratory. This notification will include information concerning the number and type of samples to be shipped, as well as the anticipated sample arrival date.

A sample custodian designated by the laboratory will be responsible for maintaining sample custody and for maintaining all associated custodial documentation records. After receiving the samples, the sample custodian will check the original chain-of-custody record and request for analysis documents against the labeled contents of each sample container for correctness and traceability. The chain-of-custody record will be signed by the sample custodian, and the date and time that the sample shipment was received at the laboratory will be recorded. The samples will then be logged into the laboratory system.

Care will be exercised in the laboratory to annotate any labeling or descriptive errors associated with the sample containers. In the event of discrepant documentation, the laboratory will immediately contact TRC-EC as part of the corrective action process. A qualitative assessment of each sample container will be performed to note any anomalies, such as broken or leaking bottles. This assessment will be recorded as part of the incoming chain-of-custody procedure.

Samples will be stored in a secured area and at a temperature of approximately 4°C, if necessary, until analyses are performed. A laboratory chain-of-custody record will accompany the sample or sample fraction through final analysis for sample control. A copy of the chain-of-custody record will accompany the laboratory's analytical report and will become a permanent part of the project's records.

2.6 Calibration Procedures and Frequency

Instruments and equipment used to gather, generate, or measure environmental data will be calibrated with sufficient frequency and in such a manner that accuracy and reproducibility of results are consistent with the instrument manufacturer's specifications.

Calibration of field instruments will be performed at intervals specified by the manufacturer or more frequently, as conditions dictate. At a minimum, calibration of equipment will be performed at the start and completion of each day of use. However, additional calibrations may be completed as becomes necessary as a result of adverse weather conditions or questionable instrument readings. Equipment manuals describing calibration procedures will be maintained in the field office during site investigations.

Within the laboratory, laboratory instrumentation calibration will be conducted in accordance with the laboratory's standard operating procedures. For all analyses for which EPA-approved methods exist, the laboratory will employ such methods and follow the calibration procedures and frequencies as specified in the methodology.

2.7 Analytical Procedures

EPA-approved methods will be used for all chemical analyses for which such methods exist. Organic priority pollutant parameters will be analyzed by EPA Methods 608, 624, and 625, and inorganic priority pollutant parameters will be analyzed by EPA Series 200 ICP or AA methodologies. Analytical results will be presented in Contract Laboratory Program (CLP) Tier 1 format. For other parameters, the associated EPA methodologies will be used for analysis.

For geotechnical analyses, the following ASTM methodologies will be used:

- California Bearing Ratio - ASTM D 1883
- Organic Content - ASTM D 2974
- Sieve Analysis - ASTM D 422

2.8 Internal Quality Control Checks and Frequency

Quality control checks will be performed to ensure the collection of representative samples and the generation of valid analytical results on these

samples. These checks will be performed by project participants through the program under the guidance of the TRC-EC QA Manager.

The TRC-EC internal QC checks for the sampling aspects of this program will include, but not be limited to, the following:

- Use of field notebooks to ensure completeness, traceability, and comparability of the samples collected.
- Field checking of field notebooks and sample labels by a second person to ensure accuracy and completeness.
- Strict adherence to the sample chain-of-custody procedures outlined in Section 2.5.4 of this document.
- Calibration of the field monitoring equipment (HNU and/or OVA), as described in Section 2.5.6 of this document.

3.0 HEALTH AND SAFETY PLAN

3.1 Introduction

This Health and Safety Plan (HASP) has been prepared for specific application to the Remedial Design Investigation activities for the ground water operable unit at Tanks 53 and 56, Tank Farm Five.

This HASP has been prepared to protect worker health and safety during additional site investigation activities at Tank Farm Five. The HASP is intended as an addendum to a March, 1989 Health and Safety Plan prepared in support of the Phase I RI field activities.

Section 3.2 of the HASP presents project objectives while Section 3.3 describes the anticipated hazards which may be encountered at the study sites. Section 3.4 discusses project staffing, organization and responsibilities. Section 3.5 describes TRC-EC's Corporate Health and Safety program and adherence to regulatory standards. Section 3.6 describes site control measures to be employed at the site to maintain order and minimize chemical and physical hazards to on-site personnel, visitors, and the public. Section 3.7 describes site communications while Section 3.8 describes Health and Safety orientation meetings, and weekly Health and Safety meeting updates. Section 3.9 describes task-specific Health and Safety procedures as well as chemical and physical hazards, site monitoring, action levels, personnel protective equipment, and decontamination and disposal procedures. Lastly, Section 3.10 describes emergency procedures, emergency phone numbers, and a map of the route to a hospital.

3.2 Project Objectives

The objective of this Work Plan is to define the level of investigation associated with remedial design investigations at Tank Farm Five. The site investigations will be conducted to define hydrogeological characteristics of

the site as well as to provide geotechnical information for site construction activities. The findings of these investigations will be used to develop the interim remedial design for the ground water operable unit associated with Tanks 53 and 56.

One of the purposes of this HASP is to inform site investigation personnel of the currently known and suspected hazards associated with work at the site. All site personnel, including subcontractors, are required to become familiar with and follow provisions of this plan. Although all employees are required to follow the guidelines set forth herein, the safety of site personnel is ultimately the responsibility of the individual and his respective employer. Copies of this HASP will be available to on-site personnel for orientation to anticipated on-site hazards (based on currently available data), as well as to the health and safety procedures to be followed during implementation of this program. TRC-EC or the Navy cannot be responsible for enforcing provisions of this plan for the health and safety of site personnel other than their own employees.

To meet design objectives, field explorations will include geotechnical soil borings and associated soil sample collection, observation and pumping well installations, ground water sample collection, completion of a pumping test, and completion of a water supply flow test. Following completion of site investigation activities, a land survey will be conducted to define site investigation locations. These activities will be undertaken as described in the Sampling and Analysis Plan provided herein as Section 2.0.

3.3 Site Hazard Summary

Hazards which may be encountered at this site can be classified into three general categories: chemical, physical, and natural. Chemical hazards are

site-specific and involve potential exposure to chemical contaminants in soil, ground water, and volatilized components in air. Physical hazards are generally occupationally specific and involve some type of accident. Natural hazards are created by natural environmental circumstances such as weather, poisonous plants, poisonous animals, insect bites, etc.

3.3.1 Chemical Hazards

A review of the available historic information indicates a number of potential contaminants may be present in the area of Tanks 53 and 56. Table 3-1 provides the lower value of 1992-1993 Threshold Limit Values (TLVs) or Permissible Exposure Limits (PELs) published by the American Conference of Governmental Industrial Hygienists for contaminants which may be present. TLVs refer to airborne concentrations of substances to which the average worker is presumed to be able to be exposed without adverse effects. TLVs are established assuming a worker is exposed to the contaminant for a period of eight hours per day, five days per week for a working lifetime of twenty years.

The potential for exposure to site contaminants could result from inhalation, ingestion, or direct contact (skin absorption) with soils or waters contaminated with volatile organic hydrocarbons. Common symptoms of acute exposure to VOCs include headaches, dizziness, nausea, eye irritation, fatigue, loss of coordination, visual disturbances, abdominal pains, and cardiac arrhythmia. Chronic exposures to solvents, hydrocarbons, and lead can lead to skin diseases; nervous and respiratory system disorders; kidney, liver, brain, and heart malfunctions; and cancer.

Potential contaminants from former or current activities that may be encountered at the site were previously summarized in Section 1.4. A more detailed discussion of the findings of the Phase I RI follow. All

environmental matrices are discussed, although remedial design investigation activities will result mainly in exposures to soils and ground water.

Soil Assessment - VOCs, BNAs, pesticides, and inorganics were detected in on-site soils. In general, minimal soil contamination was detected at the site, with the exception of elevated TPH levels detected in surface soils adjacent to the oil/water separator and in a soil boring sample collected along the site access road.

VOCs were detected in surface and subsurface soil samples at very low levels (i.e., less than 10 ppb) and are not considered to represent significant subsurface VOC contamination. BNAs were not detected at levels greater than the contaminant-comparison level (i.e., greater than 10 ppm total BNAs). Only two soil samples exhibited BNAs at a concentration greater than 1 ppm (4.6 and 1.3 ppm) and those concentrations consisted entirely of phthalate esters and PAHs, respectively. Therefore, BNA soil contamination at this site is not considered to be significant. Pesticides were detected at low levels (i.e., 10's of ppb) in two surface soil and one subsurface soil sample and are not considered to be significant soil contaminants. No PCBs were detected in soil samples. Inorganics were generally detected at levels exceeding background levels in subsurface soil samples. Lead was detected above background in one surface soil sample collected from adjacent to the oil/water separator. Total petroleum hydrocarbons (TPH) analysis of soil samples identified the presence of TPH across the site, ranging in concentration from 4 to 60,000 ppm. The highest TPH levels were detected in visibly oily samples collected at Tank 50. Significantly elevated levels of TPH (TPH greater than 100 ppm) were detected in surface soil samples collected at Tanks 49, 50, 51 and 55.

Ground Water Assessment - VOCs, BNAs, and inorganics were detected in ground water samples. VOCs and inorganics were detected at levels exceeding ground water action levels.

VOCs were detected at levels exceeding ground water action levels in only one on-site well (MW-53W) and consisted mainly of petroleum-related VOCs. Petroleum product was also observed in wells MW-53W and MW-53E, both located in the ring drain of Tank 53. The presence of low VOC levels in downgradient well MW-4 indicates the potential migration of the ground water contamination observed adjacent to Tank 53. BNAs were only detected in well MW-53W and consisted entirely of PAHs. Detected levels did not exceed ground water action levels. No Pesticides or PCBs were detected in ground water samples. While inorganic concentrations exceeded ground water action levels in all wells, including the background well, the highest levels of inorganic analytes were detected in wells in the central portion of the site.

Surface Water and Sediment Assessment - Lead and TPH were detected in sediment samples; no PCBs, lead or TPH were detected in surface water.

No PCBs were detected in sediment samples. Lead was detected in all sediment samples but at levels less than background soil levels. TPH was detected in sediment samples at concentrations ranging from 4 to 155 ppm, with detected levels increasing with distance downstream.

Structure Sample Assessment - The distribution of contaminants within the oil/water separator was as follows:

- Soil: VOCs, BNAs, and inorganics; and
- Water: inorganics.

One VOC was detected in one soil sample collected from the oil/water separator at a very low (2 ppb) level. Low levels of two BNAs were detected in one soil sample collected from the oil/water separator. No pesticides or PCBs were detected in soil samples and no inorganics were detected in the soil samples at levels exceeding background levels.

No VOCs, BNAs, pesticides, or PCBs were detected in the surface water sample collected from the oil/water separator. Cadmium was the only inorganic analyte which was detected in the water sample at levels exceeding surface water quality criteria.

Tank Contents Assessment - The distribution of contaminants within the oil and water samples collected from the on-site tanks was as follows:

- Oil: VOCs, BNAs, and inorganics; and
- Water: VOCs, BNAs, and inorganics.

VOCs were detected in the oil samples collected from the on-site tanks at very elevated levels. The VOCs consisted of petroleum-related hydrocarbons and chlorinated hydrocarbons. Total VOC levels exceeded 100 ppm in a majority of the tanks. BNAs were detected in the oil samples and consisted primarily of PAHs and bis(2-ethylhexyl)phthalate. Total BNA levels in excess of 1,000 ppm were detected in six of the oil samples. Only PAHs were detected in the oil sludge sample. Oil samples were not analyzed for pesticides. No PCBs were detected in the oil samples. Iron and lead were the only inorganics detected in greater than 50% of the oil samples. The EP Toxicity extract analysis detected barium at a level which exceeds the EP Toxicity federal standard.

VOCs were detected in all of the tank water samples, with total VOC concentrations ranging from 2 to 4,917 ppb. The main VOC compounds detected included the same VOCs detected in the oil samples. BNAs detected in the water samples consisted of PAH compounds, phenols, and dibenzofuran. Total BNA concentrations ranged from 31 to 895 ppb. Tank water samples were not analyzed for pesticides or PCBs. The inorganics detected in greater than 50% of the tank water samples include barium, calcium, iron, potassium, magnesium, manganese, and sodium. The analyte concentrations in the water samples were typically higher than those detected in the oil samples.

3.3.2 Physical Hazards

Primary physical hazards at the site are those associated with drilling and pump test activities. Hazards that could be encountered during site investigations include falls and trips, injury from lifting heavy objects, falling objects, eye injuries, head injuries, and pinched or crushed hands and feet. A fire hazard may also be present due to the use of gasoline-powered equipment, and the possible presence of flammable materials in subsurface soils.

3.3.3 Natural Hazards

Natural hazards such as weather, poisonous plants, animals, and insects cannot always be avoided. Based on available information and current site conditions, the site safety officer and field personnel shall use their best judgement to avoid these potential hazards.

Natural hazards also include exposure to adverse weather conditions including heat and cold stress.

3.4 Staff Responsibilities

TRC-EC staff listed below will be responsible for the respective activities listed.

Program Manager

- Holds ultimate responsibility for satisfactory completion of the project.

Project Manager

- Provides overall project management and control.
- Maintains day-to-day liaison with NAVFAC Project Officer and subcontractors.
- Notifies NAVFAC Project Officer of any site emergencies.

- Prepares, reviews, and transmits project documents to NAVFAC.
- Conducts the initial health and safety site orientation.

Health and Safety Director

- Assists in the development and review of the HASP.
- Provides ongoing industrial hygiene support to the Project Manager.
- Reviews and approves significant changes and/or deviations to the HASP.
- Provides consultation to the Project Manager on technical aspects of the HASP and its implementation.

Project Field Manager

- Coordinates and supervises fieldwork.
- Notifies Project Manager of deviations from the Health and Safety Plan.
- Assures that fieldwork proceeds according to Health and Safety Plan requirements.
- Designates On-Site Coordinator (OSC)

On-Site Coordinator (OSC)

- Primary responsibility for notification of and transport of injured field personnel to a hospital in the event of an accident.
- Monitors field investigations to ensure compliance with the approved HASP.
- Recommends modification of the HASP to the Project Manager as soon as practical after it is apparent that the Plan should be modified.
- Keeps non-essential personnel outside study zone boundaries. Logs in the field notebook personnel who enter into the study zone.
- Appoints alternate on-site coordinator on an as needed basis.
- Uses appropriate portable field instruments to monitor site conditions during investigatory activities.
- Maintains a log of field activities, monitoring data, and site meetings.

On-Site Coordinator - Alternates(s)

- Assumes all functions and responsibilities of the OSC in his/her absence.

Subcontractors

- Immediately notifies the on-site coordinator of hazardous or potentially hazardous conditions or environments that are not addressed or not adequately addressed in the HASP.
- Conducts work in a safe manner.

3.5 Regulatory Requirements and Personnel Qualifications

To be authorized for field explorations, TRC-EC field personnel and subcontractor field personnel (drilling contractors) must meet the minimum requirements described in these subsections.

Documentation of the requirements described below will be maintained by TRC-EC for TRC-EC personnel involved in field activities. Subcontractors and regulatory personnel are responsible for maintaining the required documentation for their field personnel.

3.5.1 Medical Monitoring

In compliance with OSHA medical monitoring regulations (29 CFR 1910.120), field supervisory personnel and field sampling personnel shall have received an examination by a licensed occupational physician. The most recent exam shall have been received within the 12-month period proceeding this work, and each employee shall have been determined by the attending physician to be physically able to perform the work and to use respiratory and other protective equipment as required for field investigations.

3.5.2 Health and Safety Training

Field personnel shall have received training and/or experience which, at a minimum, satisfies the OSHA regulations for hazardous waste and emergency response (29 CFR 1910.120).

3.5.3 Respirator Training

All personnel who enter the Exclusion Zone shall have completed a respiratory protection program which, at a minimum, satisfies the OSHA regulations (29 CFR 1910.134). This program shall include: 1) instruction in the proper use and limitations of respirators; 2) proper fitting of personnel for a respirator, using a qualitative or quantitative fit test method; and 3) teaching personnel how to conduct a positive and/or negative pressure fit test. The respirator which is used to fit test personnel will be individually assigned and available for site work. TRC-EC provides respiratory protection to employees involved in activities at work locations where the presence of respirable hazards is known or suspected.

Field staff assigned to this project shall be capable of using and inspecting a cartridge respirator. All field staff shall have their own personal respirator. The maintenance of that respirator shall be the responsibility of the individual. OSHA requires that respirators be inspected both before and after use and that respirators not used routinely shall be inspected after use and at least monthly. At the time the respirator is issued and used, the individual receiving it shall test the fit (qualitatively), and inspect the gaskets, exhalation valve, face shield, head straps, and cartridges.

Individuals are responsible for cleaning/disinfecting their respirators. Acceptable procedures include washing using respirator-approved detergent/disinfectant in warm water and rinsing or air drying in a clean place.

3.6 Site Control

The purpose of the site control measures discussed in this section are to maintain order at the site and to minimize chemical and physical hazards to on-site personnel, visitors, and the public.

3.6.1 Site Access

The site is located within the confines of the Newport Naval Base. In general, physical access to the site is inherently restricted by being on the Newport Naval Base and by the presence of chain-link fencing at the site.

3.6.2 Exclusion/Decontamination Zones

During subsurface explorations (e.g., soil borings), the OSC or alternate shall establish a 25-foot exclusion zone around the operating equipment (e.g., drill rig). The exclusion zone will be demarcated using caution tape or barricades. The OSC or alternate will be responsible for keeping nonessential personnel outside the exclusion zone boundaries. In the event that visitors or unauthorized personnel are present during field activities, the OSC or alternate shall verbally request that they maintain a safe distance outside of the area marked by the caution tape and safety cones. Prior to entering the exclusion zone, site personnel shall have donned the proper personnel protective equipment (PPE) for expected site conditions, as outlined in Section 3.9, or as determined by the OSC or alternate.

A contamination reduction station, or decontamination area, shall be established adjacent to the exclusion zone. The contamination reduction zone will be established at the upwind side of the exclusion zone and will consist of a taped off area adequate in size to comfortably contain decontamination equipment. Personnel exiting the exclusion zone shall undergo appropriate

decontamination, if required by the task-specific procedures described in Section 3.9.

Disposal of investigation derived waste materials is described in Appendix A of this Work Plan.

3.7 Communications

Communication into or out of the Exclusion Zone will be accomplished by voice. When moving drilling equipment, the driller's helper shall serve as signal person. Signal persons shall use standard hand signals to instruct the equipment operator left, right, forward, reverse and stop.

3.8 General Health and Safety Work Precautions

3.8.1 Health and Safety Site Orientation

All site investigation personnel shall be required to read this HASP and attend the Health and Safety Site Orientation meeting. Documentation of participants will be maintained as part of project records. The HASP will accompany field personnel to each site and shall be maintained at a location known to each individual working on-site. Field project personnel will sign a Personnel Safety - Acknowledgement Form, as presented in Appendix B.

The Project Manager or OSC will conduct a health and safety site orientation prior to the initiation of field activities. The orientation will cover all aspects of this HASP. Particular emphasis will be placed on a review of potential site contaminants and their potential health effects; accident prevention; safe work procedures; precautionary measures; use of personnel protective equipment; and emergency response procedures. All field staff are required to attend.

3.8.2 Health and Safety Briefings

The OSC or alternate will conduct a Health and Safety Briefing on a routine basis. Topics to be covered include personnel protective equipment, personnel and equipment decontamination procedures, accident prevention, and any modifications or amendments to the Health and Safety Plan. All field staff are required to attend.

3.9 Task-Specific Health and Safety Procedures

The following general health and safety procedures will be employed for work conducted at the site.

3.9.1 Chemical and Physical Hazards

Pump test and subsurface soil exploration activities could result in the exposure of workers to contaminated soils, contaminated ground water, contaminated washwater from decontamination procedures or vapors. Such activities can lead to worker exposure via inhalation, ingestion or permeation through the skin (skin absorption). The use of proper personnel protection equipment can minimize these potential exposures.

3.9.2 Site Monitoring

The OSC shall use an HNu PI-101 (or equivalent) photoionization detector (PID) with either a 10.2 or 11.7 electron volt lamp (or flame ionization detector - FID, OVA 128, or equivalent) to monitor organic vapors in the breathing zone at the upwind boundary of the Exclusion Zone at the beginning of each day, to establish a daily background reading. Monitoring will also be conducted in the worker's breathing zone during subsurface explorations.

Other monitoring equipment will include an explosivity/oxygen meter to monitor ambient air for explosive vapors and oxygen content.

3.9.3 Action Levels

All field work will begin in Level D personnel protective gear, based on the suspected contaminants at the site and anticipated exposure pathways. Based on positive PID readings in the breathing zone, or site conditions, the OSC shall upgrade or downgrade Personnel Protective Equipment (PPE) requirements as described below.

The following action levels are based on PID breathing zone readings:

- 0 to 1 PID unit above background: Level D
- 1 to 5 PID unit above background for longer than one minute: Modified Level D
- 5 to 25 PID units above background: Level C
- 25 PID units or greater: discontinue operations. Make arrangements to continue work in Level B protective equipment or use Level B to retrieve/demobilize equipment.

The following action levels are based on explosivity/oxygen meter readings:

- If airborne concentrations of flammable vapors exceed 10 percent of the lower explosive limit (LEL), no ignition sources will be permitted in the area;
- If ambient conditions exceed 25 percent of the LEL at a distance of one foot from the source, or 10 percent at a distance of two feet or greater, then site operations will be halted and appropriate corrective actions (upgrade of PPE, or abandonment of the exploration) will be taken.

The OSC may also make the decision to upgrade the PPE requirements, even if positive PID or elevated LEL readings are not noted. This decision will be based on site conditions including visual or sensory observation of soil or ground water contamination, or other site hazards.

3.9.4 Personnel Protective Equipment (PPE)

This section contains specific provisions for the use of Personnel Protective Equipment (PPE). It shall be the responsibility of the OSC to make the determination of the level of PPE to be used by personnel within the Exclusion Zone. The decision of the OSC will be based on site monitoring (Section 3.9.2), action levels (Section 3.9.3), knowledge of the site, and observed site conditions. Changes affecting the level of PPE defined in the HASP will be at the direction and approval of the TRC-EC Project Manager and/or TRC-EC Director of Health and Safety, except in the case of an emergency during which time it will be the responsibility of the On-Site Coordinator to modify PPE levels.

Level D protection shall be used at the start of the field work. Level D protection shall include use of the following items:

- work clothes;
- hard hat (during subsurface explorations) meeting ANSI Z89.1 specifications;
- work boots; and
- chemical protective gloves when collecting soil and water samples (solvex/latex/vinyl/nitrile).

Level D protection may also include the use of a polycarbonate faceshield, attached to the hard hat, in the event that potential splash conditions are present. Splash conditions are most likely to be present during decontamination of heavy equipment. Use of the splashguard shall be at the discretion of the OSC.

Upgrade to modified Level D may be necessary if the concentration of VOCs detected in the breathing zone of the workers exceeds the action level of 1 PID unit for longer than 1 minute, as discussed in Section 3.9.3, or if warranted by other site conditions. Modified Level D protection will include all of the PPE required for Level D plus the following:

- PVC or rubber overboots or disposable boot covers;
- Tyvek or equivalent jump suit with ankles and wrists duct-taped;
- chemical protective outer gloves (solvex/nitrile); and
- inner glove liners (latex/vinyl).

Upgrade to Level C may be necessary if the concentration of VOCs detected in the breathing zone of the workers exceeds the action level of 5 PID units discussed in Section 3.9.3, or if warranted by other site conditions. Level C protection will include all of the PPE required for Modified Level D plus appropriate respiratory protection. The specific respirator to be used for Level C protection shall be a NIOSH approved respirator with compatible cartridges. Respirator cartridges will be changed at the first sign of break through, or daily at a minimum, when in use.

It is anticipated that protective Level D or Modified Level D will be appropriate for carrying out most work tasks related to this project. A sufficient inventory of necessary equipment will be maintained on-site to provide these levels of protection for all site personnel who must work within the Exclusion Zone.

3.9.5 Decontamination

Upon leaving the Exclusion Zone, personnel must undergo appropriate decontamination. The nature of the decontamination requirements will depend on the nature of the work conducted and whether immediate re-entry into the Exclusion Zone is planned, or if complete egress from the Exclusion Zone is intended. The decontamination requirements will also depend on the level of protection used within the Exclusion Zone and the suspected degree of contamination. This area will be located immediately outside the access opening of the Exclusion Zone on its apparent upwind side. This area shall contain the decontamination stations necessary to allow rest breaks and

respirator cartridge changes (if appropriate), as well as for complete decontamination as required for food and beverage breaks, or exiting the work area. Periodic air monitoring will be conducted in the contamination reduction zone (decontamination area) when this area is used.

3.9.6 Disposal

Disposal or storage of materials generated during site activities will be conducted as described in Appendix A of this Work Plan.

3.10 Emergency Response

3.10.1 Emergency Information

A list of emergency phone numbers will be maintained at the site during active investigation activities. In addition, a copy of this HASP will accompany field personnel to the site and shall be maintained at a location known to each individual working on-site.

The Newport Hospital is the nearest medical facility. A map with a suggested route to the hospital and emergency phone numbers are provided in Figures 3-1A and 3-1B, and Table 3-2, respectively.

The Newport Hospital will accept and treat (to the extent it is capable) workers exposed to various suspect substances or physically injured at the project site.

In the event of a site emergency, the OSC or alternate shall evacuate site personnel to a safe area and then contact the appropriate authorities listed above. As soon as practical, after contacting the authorities and ensuring the safety of site personnel, the OSC shall contact the TRC-EC Project Manager.

3.10.2 General Procedures

An OSHA approved first aid kit, eye wash bottles, and a fire extinguisher rated for Class A, B and C fires will be present within or near the Exclusion Zone during subsurface explorations. It shall be the responsibility of the OSC to make a determination as to the proper response for a particular emergency. As soon as practical after emergency response, the OSC shall brief the Project Manager as to the nature of the incident, and response actions taken. The OSC, Project Manager, and Health and Safety Director, shall evaluate the site conditions and make a determination regarding any measures that could be taken in the future to prevent incidents of a similar nature from being repeated. The Project Manager shall notify the NAVFAC Project Officer regarding site emergencies.

3.10.3 Emergency Response Plan - Specific Incidents

3.10.3.1 Chemical Exposures

Inhalation

- A. If site personnel experience symptoms suggesting exposure to toxic chemicals (light-headedness, dizziness, headache, nausea, shortness of breath or burning sensation in the mouth, throat or lungs), the person should be immediately escorted from the contaminated environment to fresh air.
- B. If unconscious, the victim should be removed from the contaminated area immediately and brought to the nearest hospital. Rescuers shall wear appropriate Personnel Protective Equipment during rescue.
- C. If the victim is no longer breathing, he/she shall be moved away from the contaminated area. Immediate mouth-to-mouth resuscitation or some alternate form of effective artificial respiration shall begin.
- D. If the victim has no pulse, he/she shall be moved away from the contaminated area and cardio-pulmonary resuscitation (CPR) should begin immediately. It may be necessary for the victim to receive artificial resuscitation and CPR simultaneously.

Should any of the above scenarios be encountered, emergency medical attention/advice must be obtained immediately. The TRC-EC Project Manager should be notified of the situation and the affected individual(s) status as soon as practical.

Skin Exposure

If there is skin contact with toxic or potentially toxic chemicals, the skin should be washed with copious amounts of soap and water. If clothing is contaminated, it should be removed immediately and the skin washed thoroughly with running water. All contaminated parts of the body should be thoroughly washed. It may be necessary to wash repeatedly.

Ingestion

If site personnel ingest toxic chemicals, obtain medical attention immediately.

Eyes

If foreign matter should get into the they should be flooded with water so that all surfaces are washed thoroughly. Washing should be continued for at least fifteen minutes. Medical attention should be obtained immediately.

3.10.3.2 Physical Injury of Personnel

At a minimum, one person on site will be trained in Standard Red Cross First Aid. In the event of an emergency, this person will administer appropriate first aid and arrange transportation for injured personnel to the designated medical facility, if necessary. This person will evaluate the site conditions to determine if the causal hazard still exists. Site personnel shall not re-enter the Exclusion Zone until the cause of the injury is determined, and the Exclusion Zone is designated safe to re-enter.

3.10.3.3 Fire/Explosion

In the event of a fire or explosion, the OSC shall alert the NETC Fire Department by calling from a phone nearby the affected area. All personnel shall move to a safe distance from the involved area. The OSC shall make a determination regarding the severity of the fire, and whether site personnel shall attempt to extinguish it. Fires shall not be fought by site personnel if an explosion hazard is present or if a large fire is present on this site.

4.0 DETAILED STATEMENT OF ARARS

4.1 Introduction

Prior to identifying the ARARs applicable to the interim remedial action being designed at Tank Farm Five, further definition of the action is appropriate.

The ground water extraction system will be constructed around Tanks 53 and 56 and within the approximate boundaries of the plume to maximize the collection of contaminated ground water. The actual number of wells, pumping rates, and configuration of the extraction well network will be determined during the remedial design process. Ground water monitoring will be conducted during the interim remedial action to confirm the capture of contaminated ground water, as further discussed in Section 5.0.

The current State of Rhode Island ground water classification for Tank Farm Five is class GA-NA. GA indicates ground water sources which may be suitable for public or private drinking water without treatment. NA indicates areas of non-attainment which are known or presumed to be out of compliance with the ground water standards of the assigned classification.

The ground water treatment technologies to be implemented at Tank Farm Five consist of inorganic removal using a coagulation/filtration process, followed by UV oxidation for organic treatment. Discharge of the treated ground water will be to the Newport Wastewater Treatment Facility.

4.2 ARARs Identification and Analysis

The interim remedy for the ground water operable unit at Tanks 53 and 56 will attain all applicable or relevant and appropriate federal and state requirements that apply to this limited scope interim action. Environmental laws from which ARARs for the selected remedial action are derived and the

specific ARARs are outlined below, discussed in the following sections and presented in tabular form in Appendix C. Since discharge of the treated ground water will be to the Newport Wastewater Treatment Facility, chemical-specific, location-specific and action-specific ARARs identified in the Record of Decision as being applicable to discharges to surface water and ground water, including ARARs related to potential impacts to wetland areas, have been deleted from this discussion. The applicability of certain action-specific ARARs is still to be determined based on the characterization treatment system residual wastes.

Chemical-Specific ARARs -

- Safe Drinking Water Act (SDWA) - MCLs and non-zero MCLGs
- Resource Conservation and Recovery Act (RCRA) - Ground water protection standards
- Rhode Island Public Drinking Water Regulations

The following chemical-specific policies, criteria and guidelines were also considered:

- USEPA Risk Reference Doses (RfDs)
- USEPA Human Health Assessment Group Cancer Slope Factors (CSFs)

Location-Specific ARARs

- Rhode Island Ground Water Protection Act

Action-Specific ARARs

- Hazardous and Solid Waste Amendments of 1984 (HSWA) Land Disposal Restrictions
- RCRA Land Disposal Regulations
- RCRA Generator Requirements for Manifesting Waste for Off-Site Disposal
- RCRA Transporter Requirements for Off-Site Disposal

- Hazardous Materials Transportation Act Rules for Transportation of Hazardous Materials
- RCRA General Facility Standards
- RCRA Preparedness and Prevention
- RCRA Contingency Plan and Emergency Procedures
- RCRA Miscellaneous Units
- Rhode Island Hazardous Waste Management Regulations
- Rhode Island Hazardous Substance Community Right-to-Know Requirements
- CWA National Pollutant Discharge Elimination System (NPDES) Permit Requirements
- CWA Discharge to Publicly-Owned Treatment Works (POTW)
- Rhode Island Pollutant Discharge Elimination Systems Regulations
- Rhode Island Pretreatment Regulations
- Occupational Health and Safety (OSHA) Recordkeeping, Reporting and Related Regulations
- OSHA General Industry Standards
- OSHA Safety and Health Standards

4.2.1 Federal and State Drinking Water Regulations

Drinking water standards, MCLs and other guidance and criteria to be considered (TBCs) were used in the development of target cleanup levels for ground water remediation.

The ground water classification at the site is GA-NA, which indicates ground water sources which may be suitable for public or private drinking water without treatment but which are located in an area of non-attainment which is known or presumed to be out of compliance with the ground water standards of the assigned classification. The quality and safety of drinking water sources are regulated by the SDWA and the Rhode Island Public Drinking

Water Regulations. MCLs are enforceable standards under the SDWA that represent the maximum level of contaminants that are acceptable for users of public drinking water supplies. MCLs are relevant and appropriate because, while ground water is not a current source of drinking water at NETC, the goal for ground water in non-attainment areas is restoration to a quality consistent with drinking water standards.

Target cleanup levels for ground water were developed based on the results of the human health risk assessment conducted for the site. Federal MCLs were the first order of standards used in establishing cleanup levels. For those contaminants for which no MCLs were available, other criteria and guidelines (i.e., TBCs) were used. TBCs used during the risk assessment and in establishing cleanup levels included USEPA RfDs and USEPA CSFs. Table 4-1 summarizes the cleanup levels for carcinogenic and non-carcinogenic contaminants of concern identified in the ground water.

The objective of the interim remedial action is to prevent further migration of the contaminated ground water. As an interim action, not all ARARs will be attained. Attainment of ground water standards and risk-based target cleanup levels will be addressed as part of the ROD for the final site remedy.

4.2.2 Federal and State Water Quality Criteria

Discharge of treated ground water will be to the Newport Wastewater Treatment Facility (WWTF). Chemical-specific discharge requirements will be established under the requirements of the WWTF's NPDES permit, pretreatment regulations and water pollution control laws.

Pretreatment standards will be developed in cooperation with the Newport WWTF. Both the state and federal NPDES requirements and pretreatment

regulations will be attained upon successful establishment of pretreatment standards for discharge from the ground water treatment system.

Compliance with the applicable treated ground water discharge regulations will be achieved through treatment and monitored through effluent sampling and analysis.

4.2.3 Federal and State Location-Specific Regulations

It is not anticipated that interim remedial action construction or operation activities will impact wetland areas, therefore all references to wetland regulations which were presented in the Record of Decision have been deleted herein. The Rhode Island Ground Water Protection Act is applicable to the interim remedial actions since the site is located in an area where the ground water is classified as GA-NA. This law provides protection of state ground waters which are or could be used as drinking water sources.

4.2.4 Federal and State Hazardous Waste Regulations

The applicability of RCRA and Rhode Island Hazardous Waste Regulations depends in part on whether the wastes handled are RCRA-hazardous wastes as defined under these regulations. Because NETC was issued a Hazardous Waste Facility Permit by RIDEM in 1985, which permitted Tanks 53 and 56 as hazardous waste storage areas, and because toxic constituents are present in the source materials and ground water, the federal and state hazardous waste regulations are relevant and appropriate to the interim remedy.

RCRA General Facility Standards, Preparedness and Prevention, and Contingency Plan and Emergency Procedures will be attained during construction and operation of the ground water treatment plant. The treatment facility will be designed, constructed and operated to minimize potential impacts to

human health and the environment. Contingency and emergency planning will be conducted.

As a result of the ground water treatment process, a residual of the coagulation/filtration system will be produced, requiring off-site disposal. Chemical analysis (including Toxicity Characteristic Leaching Procedure or TCLP testing) of this residual will be conducted to determine if the residual is considered a hazardous waste based on the regulatory definition. If determined to be a hazardous waste, RCRA regulations, including land disposal regulations, generator requirements, and transportation requirements, will apply to the ultimate disposal of the residual.

Because toxic constituents are present on-site, OSHA regulations which govern worker health and safety and recordkeeping and reporting will apply to the implementation and operation of the interim remedial action. Site workers will have the required health and safety training and will be equipped with the proper health and safety equipment. Contractors and subcontractors will comply with required health and safety procedures.

4.2.5 Federal and State NPDES and Pretreatment Regulations

State and federal pretreatment standards and PDES regulations will be met by the ground water treatment and discharge system.

5.0 PRELIMINARY MONITORING PLAN

5.1 Introduction

Monitoring will be conducted during the interim remedial action to confirm the capture of contaminated ground water and to verify the effectiveness of the on-site ground water treatment system in meeting contaminant-specific regulations regarding discharge to the Newport Wastewater Treatment Facility. This section presents a preliminary monitoring plan to be implemented during the operation of the interim remedial action at Tanks 53 and 56, Tank Farm Five. The plan will be revised based on regulatory comment, discharge requirements and any additional information or requirements defined during the remedial design process.

5.2 Preliminary Ground Water Monitoring Plan

During implementation of the interim remedial action, ground water monitoring will be required to identify any changes in the lateral extent of the ground water contaminant plume as well as changes in ground water quality over time.

A ground water monitoring program will be developed as part of the interim remedial action. The number of monitoring wells and well locations to be included in the program will be defined upon further definition of extraction well locations and associated capture zones. Currently, the preliminary design calls for the installation of three downgradient monitoring wells, which would supplement existing wells within a final monitoring program. It is anticipated that monitoring wells will be sampled on a quarterly basis, with samples analyzed for aromatic and chlorinated volatile organics as well as inorganics. Volatile organics will be measured using EPA Method 524.2 while inorganics will be measured using EPA 200 Series methodologies.

Analytical results will be presented in an annual report which summarizes trends in ground water quality. The annual report will be submitted for regulatory review.

5.3 Preliminary Treatment System Monitoring Plan

Treatment system monitoring requirements will be defined based upon the final requirements of the wastewater discharge permit issued by the Newport Wastewater Treatment Facility to the Naval Education and Training Center, as well as by operational monitoring requirements of the treatment system.

It is anticipated that the wastewater discharge permit will require monitoring for oil and grease, BOD and suspended solids at a frequency of every other day. It is anticipated that the discharge permit will also establish discharge limitations for such constituents as inorganics, total toxic organics and pH. The discharge permit will establish the monitoring location and the type of samples (grab versus composite) to be collected. The treatment system monitoring plan will be further defined upon the issuance of a discharge permit.

For treatment system operational purposes, it is anticipated that monitoring of the influent into the treatment system and at in-house process areas will be required to regularly monitor the performance of the treatment system. These requirements will be further defined during the treatment system design process.

6.0 INITIAL DRAFT CONSTRUCTION QA/QC PROJECT PLAN

6.1 Introduction

A Quality Assurance/Quality Control (QA/QC) plan is developed to ensure that the remedial system is constructed as specified in the design (quality assurance) and to allow implementation of a system of inspections and tests to monitor and control the quality of the construction project (quality control). The Construction Quality Assurance Plan is submitted with the final remedial design and is implemented during remedial construction through the use of an Independent Quality Assurance Team. The Construction Quality Control Plan is prepared by the remedial action constructor and defines activities necessary to manage, control and document work so as to ensure compliance with project requirements (i.e., plans and specifications).

6.2 Independent Quality Assurance Team

An Independent Quality Assurance Team will be established consisting of separate consultants or "in-house" personnel assigned to the project. These personnel will be responsible for examining and testing various materials, procedures, and equipment during construction activities. The qualifications and expertise of the team members will be commensurate with the scope of the project. Members of the Independent Quality Assurance Team will be independent of the constructor of the remedial action so that the results of the quality assurance effort are unbiased and objective. At this stage in the remedial design effort, identification of potential team members is premature. The final Construction QA/QC Project Plan will define the responsibilities and authorities of the organizations and key personnel involved in the design and construction of the remediation system.

6.3 Quality Assurance Plan

The QA plan will define the project QA requirements and will communicate these requirements to all involved parties. The plan will identify and define quality control measures to plan, check, and review all work before it is delivered to the client or used for construction purposes. The plan will establish the organization of the project and assign responsibility for various quality assurance issues to the construction contractor, design engineer, "in-house" personnel and appropriate regulatory agencies, as appropriate, for implementation during the remedial action construction activities. Typical activities which will be monitored under the QA program include the following:

- Review of shop drawings, product data and samples;
- Inspection of materials prior to installation to verify compliance with specifications;
- Construction monitoring;
- Monitoring of installation, testing and sampling methods to verify acceptance of materials used in construction;
- Establishment of a set of "record documents", when required, based upon information supplied by the contractor or vendor.

6.4 Construction Quality Control Activities

Construction quality control activities will be defined in the specifications' Section 01400, as outlined in the 35% Design Development Specifications submittal. The specifications require submittal of a Quality Control plan by the remedial contractor and require that the plan include the following:

- Name and qualifications, in resume format, for the QC Manager.
- A letter signed by an officer of the firm appointing the QC Manager and stating that he/she is responsible for implementing the QC program, as described in the contract, and referencing the

QC Manager's authority to direct the removal and replacement of non-conforming work.

- Procedures for reviewing, approving and managing submittals.
- Testing laboratory information.
- A Testing Plan and Log that includes tests required, referenced by the specification paragraph number requiring the test, the frequency, and the person responsible for the test.
- Procedures to identify, record, track and complete rework items.
- Documentation procedures, including proposed report formats.
- A listing of outside organizations, such as testing laboratories, architects, and consulting engineers that will be employed by the Contractor and a description of the services these firms will provide.
- A list of the definable features of work, with a definable feature defined as a task which is separate and distinct from other tasks and which requires separate control requirements.

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TABLE 2-1

CONTAINERS AND PRESERVATION METHODS FOR AQUEOUS SAMPLES

Number Containers per Sample	Sample Container*	Preservation Methods ^(a)	Analytical Method	Compound(s)
<u>Organics</u>				
2	40 ml, glass, Teflon-lined cap	Cool, 4°C HCl (4 drops)	EPA 624	PP-VOA
1	1-gal, narrow-mouth amber glass, Teflon-lined cap	Cool, 4°C	EPA 625, 608	PP-BNA, P/P
<u>Inorganics</u>				
1	500 ml, polyethylene	HNO ₃ to pH <2	EPA 200 Series ^(b)	Metals
<u>Hardness</u>				
1	250 ml, plastic or glass	Cool, 4°C HNO ₃ to pH <2	EPA 130.2	
<u>Total Suspended Solids, Total Dissolved Solids</u>				
2	100 ml, plastic or glass	Cool, 4°C	EPA 160.2, 160.1	

PP = Priority Pollutant.

VOA = Volatile Organic Analyses.

BNA = Base Neutral and Acid Extractable Analyses.

P/P = Pesticides/PCB Analyses.

(a) All samples will be stored in a refrigerated, dark area.

(b) Metals analyses, except mercury, will be performed by the furnace atomic absorption and inductively coupled plasma (ICP) atomic emission spectrometric methods. Mercury will be analyzed by the manual cold vapor atomic absorption method.

***NOTE** The sample amount requested by the laboratory to perform the analyses according to the specified method will be collected and submitted to the laboratory.

TABLE 2-2

HOLDING TIMES FOR AQUEOUS SAMPLES

Parameter	Holding Time for Samples
	Aqueous
PP Volatile Organic Compounds	14 days
PP Base Neutral/Acid Extractable Compounds	7 days to extraction; 40 days from extraction
PP Pesticide/PCB Compounds	7 days to extraction; 40 days from extraction
PP Inorganics, Iron and Manganese	6 months; except Hg - 26 days
Hardness	6 months
Total Dissolved Solids	7 days
Total Suspended Solids	7 days

TABLE 3-1

TLV/PELs
INTERIM REMEDIAL MEASURE DESIGN INVESTIGATION

Compound	TLV-TWA (ppm)	PEL (ppm)
Benzene	10 (0.1)	1
Toluene	50	100
Xylenes	100	100
Perchloroethylene	50 (25)	25
Lead	0.15 mg/m ³	0.05 mg/m ³
Mercury	0.1 mg/m ³	0.01 mg/m ³
Cadmium	0.05 mg/m ³ (0.01 - total dust/particulate) (0.002 - respirable fraction of dust)	0.2 mg/m ³

1. TLV-TWA indicates Threshold Limit Value-Time Weighted Average as listed in the 1992-1993 Threshold Limit Value publication by the American Conference of Governmental Industrial Hygienists (ACGIH). This value is the time weighted average concentration for a normal 8-hour work day and a 40-hour work week, to which all workers may be repeatedly exposed, day after day, without adverse effect. () indicate intended changes for 1992-1993.
2. PEL indicates the Permissible Exposure Limits as listed in the most recent OSHA Toxic and Hazardous Substances (29 CFR 1910 Subpart Z). PELs are time-weighted average concentrations that must not be exceeded during any 8-hour work shift of a 40-hour work week.

TABLE 3-2

SITE EMERGENCY CONTACTS
INTERIM REMEDIAL MEASURE DESIGN INVESTIGATION

<u>NETC Emergency Numbers:</u>	Command Duty Officer	841-3456 or 3457
	Security Office - Police	841-3241
	NETC Fire Protection	841-3333
	Public Works	841-4001
<u>Utilities:</u>	Rhode Island Dig Safe	800-225-4977
	NETC Dig Safe	841-2464
<u>Newport Emergency Numbers:</u>	Newport Police Dept.	847-1306
	Newport Fire Dept.	846-2211
	Newport Hospital	
	General Number	846-6400
	Emergency Room	846-6400 ext. 1120
	Poison Control Center	277-5727
<u>Additional Resources:</u>	Dr. Erdil or Dr. Stahl - TRC Company Physicians, Immediate Medical Care, Hartford, Connecticut	(203) 296-8330
	Mr. Carl Stopper - TRC Project Manager	(203) 289-8631
	Ms. Rachel Marino - NETC Environmental Coord.	(401) 841-3735
	Mr. Robert Hanley - NETC Safety Officer	(401) 841-2478

**TABLE 4-1
GROUND WATER CLEANUP LEVELS
TANKS 53 AND 56, TANK FARM FIVE**

Carcinogenic Contaminants of	Cleanup Level (ppb)	Basis	Level of Risk	
VOLATILE ORGANICS				
Benzene	5	MCL	2x10 ⁻⁰⁶	
Tetrachloroethene	5	MCL	4x10 ⁻⁰⁶	
Trichloroethene	5	MCL	6x10 ⁻⁰⁷	
Vinyl Chloride	2	MCL	4x10 ⁻⁰⁵	
INORGANICS				
Arsenic	50	MCL	*	
Beryllium	1	MCL	5x10 ⁻⁰⁵	
Lead	15	AL	NA	
SUM:			1x10 ⁻⁰⁴	
Non-carcinogenic Contaminants of Concern	Cleanup Level (ppb)	Basis	Target Endpoint of Toxicity	Hazard Index
VOLATILE ORGANICS				
1,2-Dichloroethene(cis-)	70	MCLG	Decreased hematocrit and hemoglobin	8x10 ⁻⁰²
1,2-Dichloroethene(trans-)	100	MCLG	Decreased hematocrit and hemoglobin	6x10 ⁻⁰²
1,1,1-Trichloroethane	200	MCLG	Liver	2x10 ⁻⁰²
INORGANICS				
Cadmium	5	MCLG	Proteinuria	1x10 ⁻⁰¹
Chromium (Total)	100	MCLG	None observed	2x10 ⁻⁰¹
Manganese	3650	Risk	CNS	1
Thallium	0.5	MCLG	Increased SGOT and LDH levels, alopecia	9x10 ⁻⁰²
SUM:				1

Note: The Hazard Index is summed for only those indicator compounds with the same or similar target endpoints.

MCL - Maximum Contaminant Level. National Primary Drinking Water Regulations, Final Rule Amendments to Safe Drinking Water Act (SDWA), U.S.EPA, Effective July 1992.

MCLG - Maximum Contaminant Level Goal, based on health considerations only, Final Rule Amendments to SDWA, U.S.EPA, Effective July 1992

AL - Action Level representative of drinking water quality at the tap, U.S.EPA, May 7, 1991.

* - The cleanup level for arsenic has been set at the MCL of 50 ppb. The carcinogenic risk posed by arsenic at 50 ppb in ground water will be approximately 1 in 1,000. However, in light of recent studies indicating that many skin tumors arising from oral exposure to arsenic are non-lethal and in light of the possibility that the dose-response curve for the skin cancers may be sublinear (in which case the cancer potency factor used to generate risk estimates will be overstated), it is EPA policy to manage manage these risks downward by as much as a factor of ten. As a result, the carcinogenic risks for arsenic at this Site have been managed as if they were 1 in 10,000. (See EPA memorandum, "Recommended Agency Policy on the Carcinogenic Risk Associated with the Ingestion of Inorganic Arsenic" dated June 21, 1988.)

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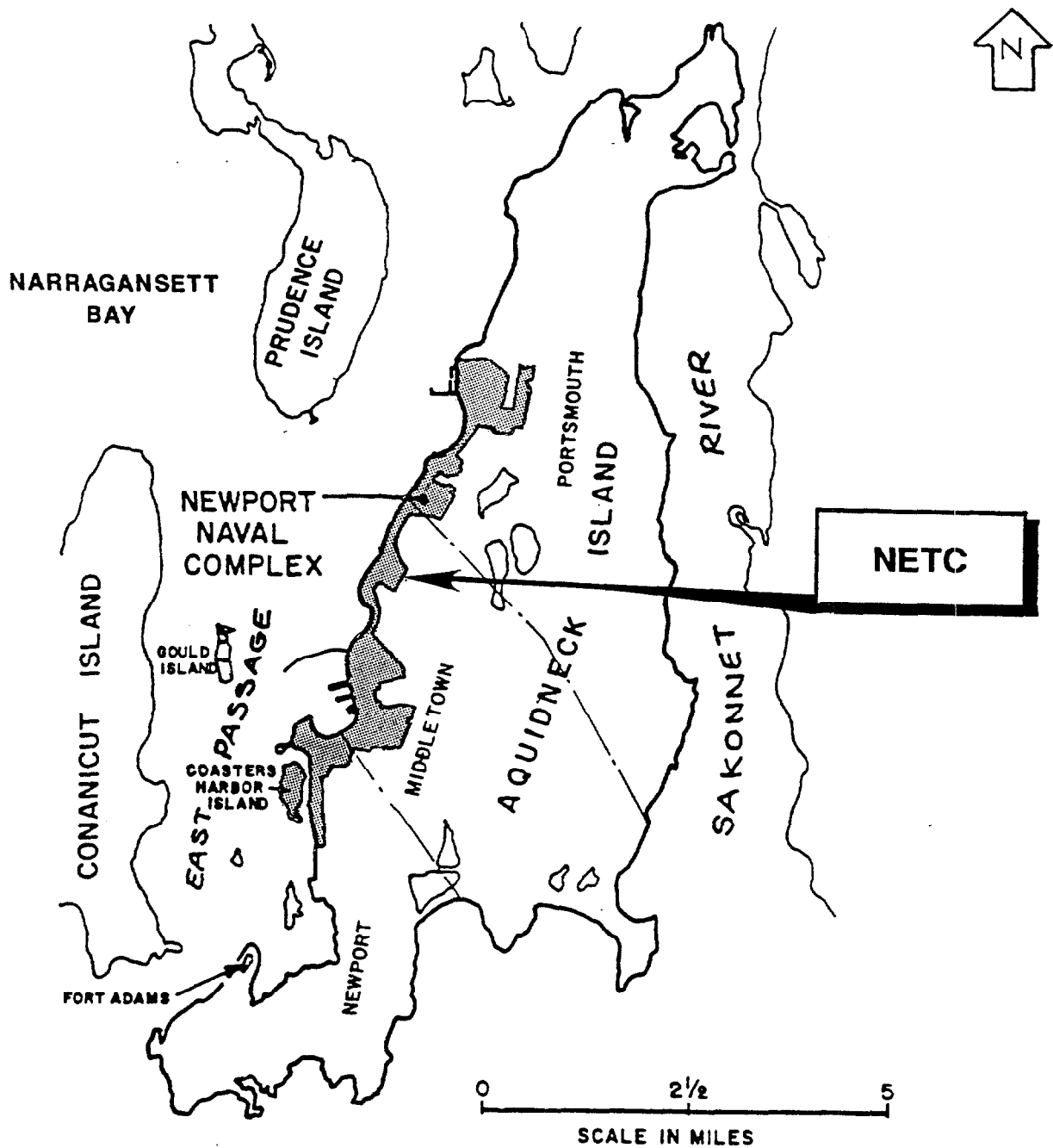
10/10/2020

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FIGURES



TRC

TRC Environmental Corporation

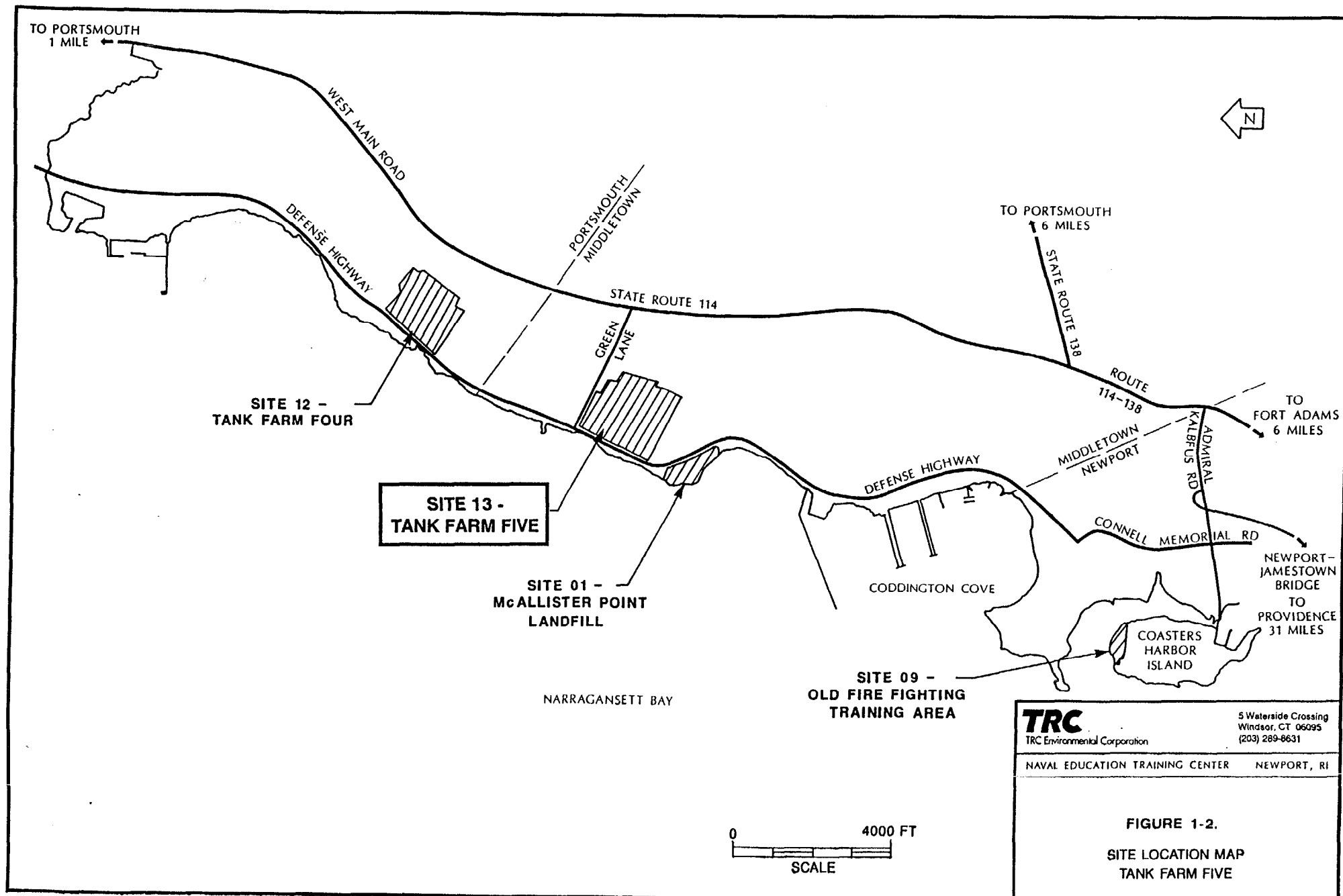
5 Waterside Crossing
Windsor, CT 06095
(203) 289-8631

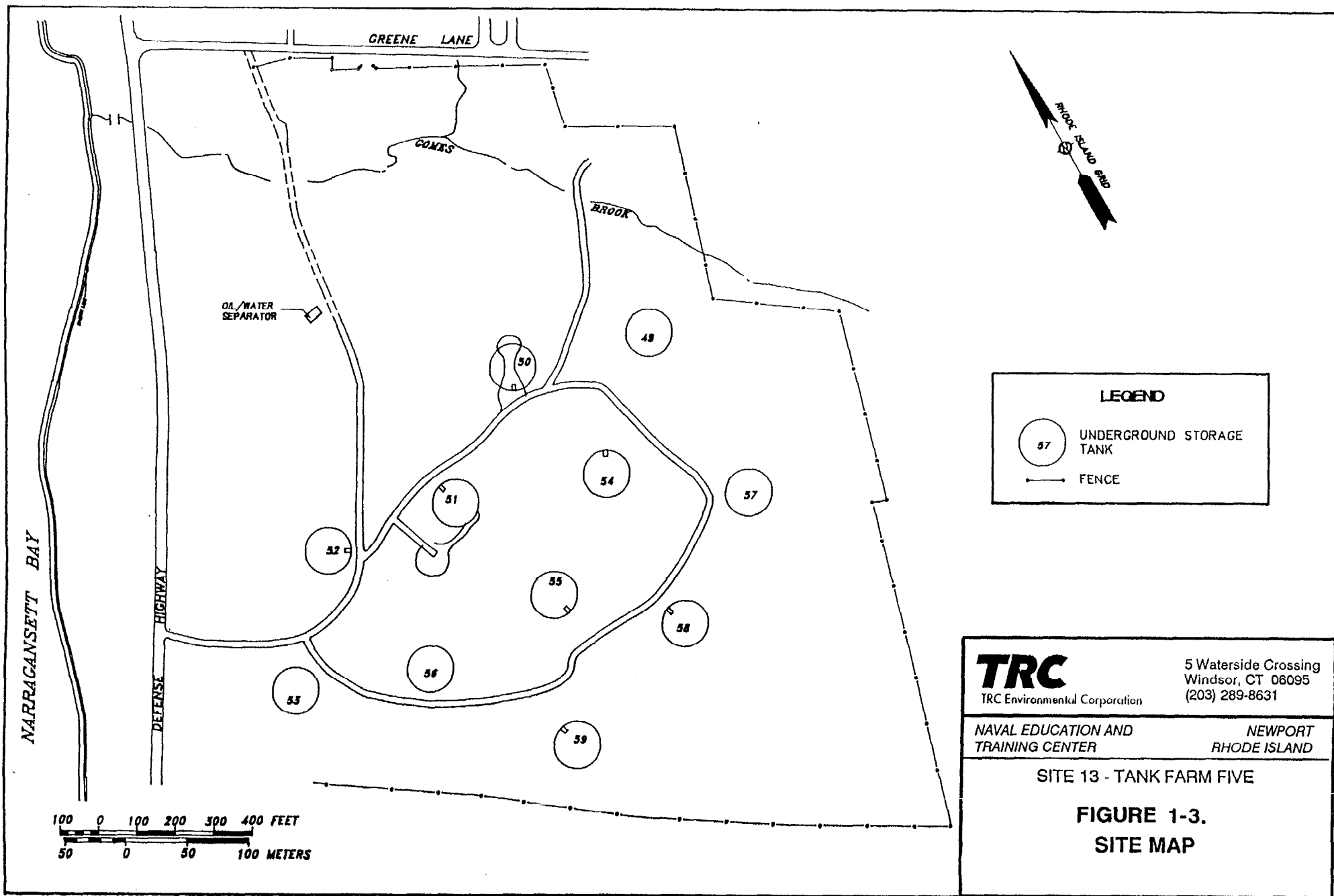
NAVAL EDUCATION
TRAINING CENTER

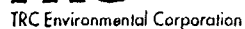
NEWPORT
RHODE ISLAND

FIGURE 1-1.
NAVAL EDUCATION AND
TRAINING CENTER VICINITY MAP

SOURCE: INITIAL ASSESSMENT STUDY
(ENVIRODYNE, 1983)

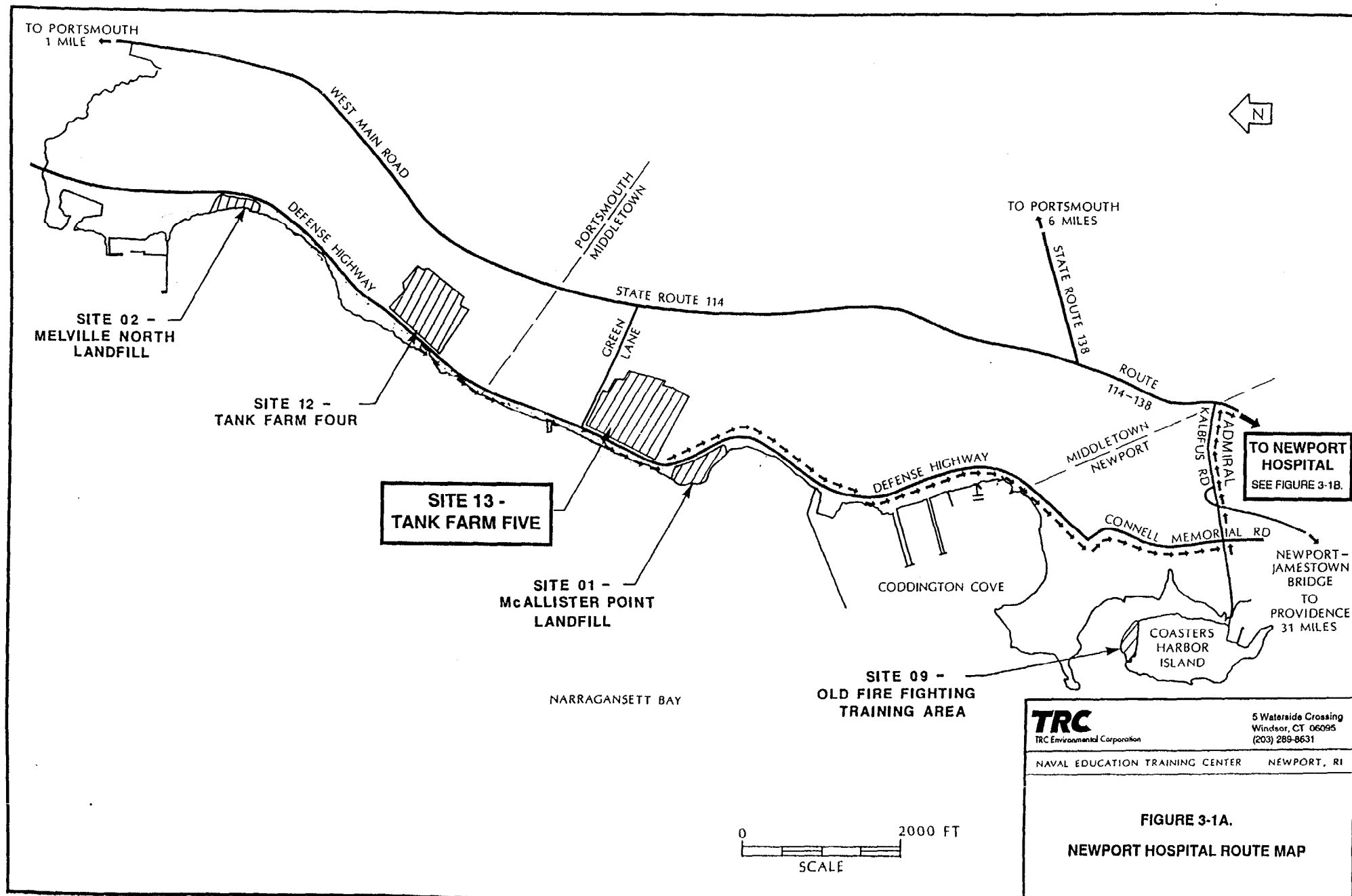


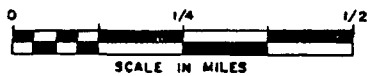
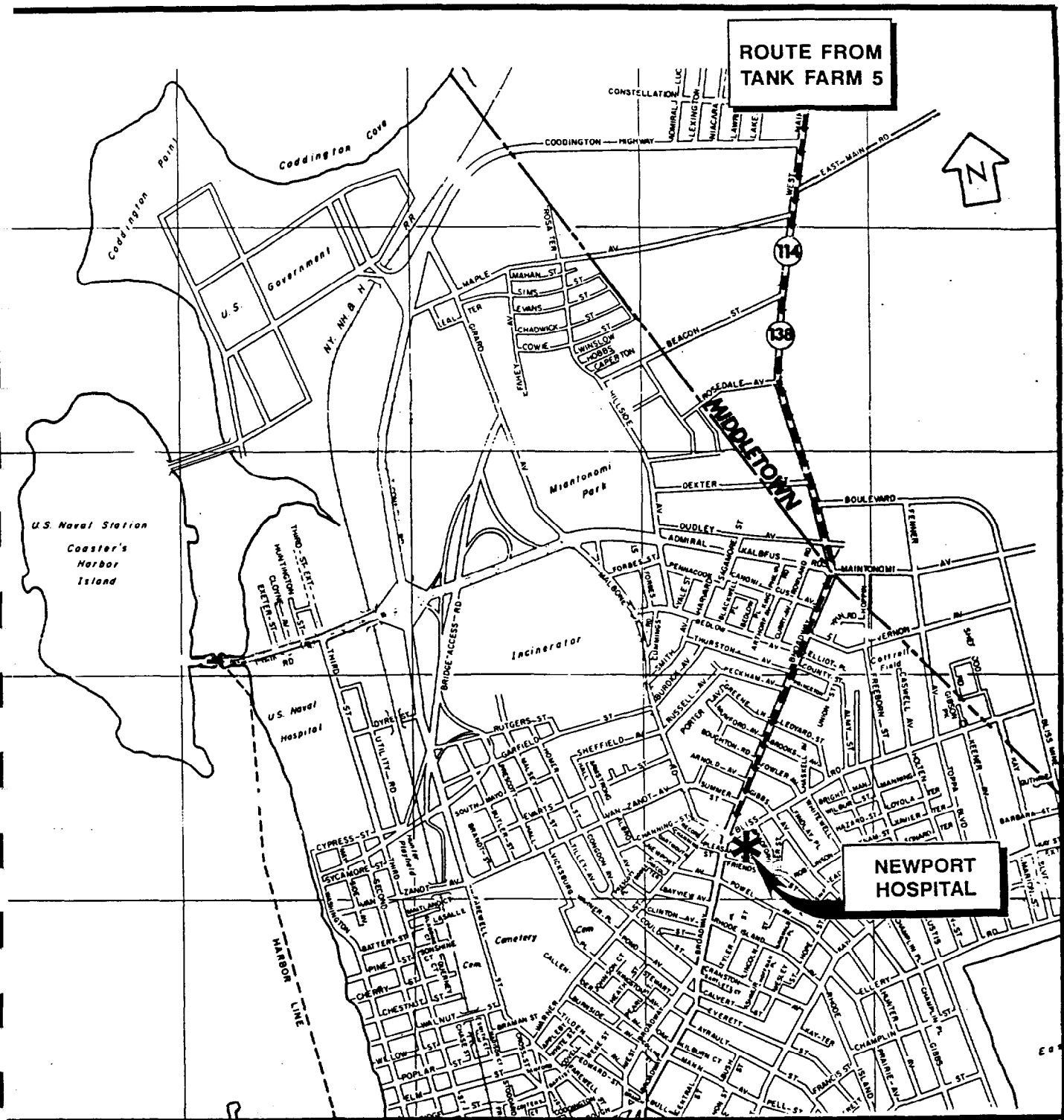


[illegible]

Distribution: Original Plus One Accompanies Shipment (white and yellow); Copy to Coordinator Field Files (pink).

FIGURE 2-2. CHAIN OF CUSTODY RECORD





TRC

TRC Environmental Corporation

5 Waterside Crossing
Windsor, CT 06095
(203) 289-8631

NAVAL EDUCATION AND
TRAINING CENTER

NEWPORT
RHODE ISLAND

FIGURE 3-1B.

NEWPORT HOSPITAL ROUTE MAP

APPENDIX C
ARARS ANALYSIS

TABLE C-1
FEDERAL CHEMICAL-SPECIFIC ARARs AND TBCs
REMEDIAL DESIGN WORK PLAN
TANKS 53 AND 56, TANK FARM FIVE, NAVAL EDUCATION TRAINING CENTER

MEDIA	REQUIREMENT	STATUS	SYNOPSIS	APPLICABILITY TO SITE CONDITIONS
Ground Water --	Safe Drinking Water Act (40 CFR 141.11-.16) Maximum Contaminant Levels (MCL's)	Relevant and Appropriate	MCL's directly apply to "public water systems", defined as systems with at least 15 connections which service a minimum of 25 persons.	Ground water at NETC is not a current source of drinking water; therefore, MCLs are not applicable, but may be relevant and appropriate. Contaminant concentrations were compared to MCLs to assess potential risks associated with ingestion of ground water.
	Safe Drinking Water Act (40 CFR 141.50-.51) Maximum Contaminant Level Goals (MCLGs)	Relevant and Appropriate	Non-enforceable health goals for public water supply systems, set at levels which result in no known or anticipated adverse health effects.	Ground water at NETC is not a current source of drinking water; therefore, MCLGs are not applicable, but may be relevant and appropriate. Non-zero MCLGs are to be used as remedial goals for current or potential sources of drinking water, per the NCP (40 CFR 300). Contaminant concentrations were compared to MCLGs to assess potential risks associated with ingestion of ground water.
	Resource Conservation and Recovery Act, Subpart F (40 CFR 264.94) Ground Water Protection Standards, Alternate Concentration Limits	Relevant and Appropriate	Sets ground water protection standards or allows for the development of alternate concentration limits for facilities which treat, store or dispose of hazardous waste.	Ground water at NETC is not a current source of drinking water; therefore, RCRA ground water concentration limits are not applicable, but may be relevant and appropriate.
	USEPA Risk Reference Doses (RfDs)	To Be Considered	Toxicity values for evaluating noncarcinogenic effects resulting from exposures to contamination.	USEPA RfDs were used to characterize risks due to noncarcinogens in ground water.

TABLE C-1 (Continued)
 FEDERAL CHEMICAL-SPECIFIC ARARs AND TBCs
 REMEDIAL DESIGN WORK PLAN
 TANKS 53 AND 56, TANK FARM FIVE, NAVAL EDUCATION TRAINING CENTER

MEDIA	REQUIREMENT	STATUS	SYNOPSIS	APPLICABILITY TO SITE CONDITIONS
Ground Water (Continued) --	USEPA Human Health Assessment Group Cancer Slope Factors (CSFs)	To Be Considered	A slope factor is used to estimate an upper-bound probability of an individual developing cancer as a result of a lifetime of exposure to a particular level of a potential carcinogen.	USEPA CSFs were used to compute the individual incremental cancer risk resulting from exposure to certain compounds.

TABLE C-2
STATE CHEMICAL-SPECIFIC ARARs AND TBCs
REMEDIAL DESIGN WORK PLAN
TANKS 53 AND 56, TANK FARM FIVE, NAVAL EDUCATION TRAINING CENTER

MEDIA	REQUIREMENT	STATUS	SYNOPSIS	APPLICABILITY TO SITE CONDITIONS
Ground Water --	RI Ground Water Protection Act (RIGL, 46-13 et seq.) Public Drinking Water Regulations	Applicable	Establishes provisions for the protection and management of potable drinking waters, including the development of ground water classifications and associated standards which specify maximum contaminant levels for each classification.	Ground water at NETC is not a current source of drinking water, but is classified as GA Non-attainment. These regulations are applicable and contaminant concentrations will be compared to the established ground water quality standards.

TABLE C-3
 STATE LOCATION-SPECIFIC ARARs AND TBCs
 REMEDIAL DESIGN WORK PLAN
 TANKS 53 AND 56, TANK FARM FIVE, NAVAL EDUCATION TRAINING CENTER

MEDIA	REQUIREMENT	STATUS	SYNOPSIS	APPLICABILITY TO SITE CONDITIONS
Ground Water--	RI Ground Water Protection Act (RIGL, Title 46, Chapter 13.1 et. seq.)	Applicable	Provides for protection of state ground waters, requiring the maintenance or upgrading of existing or potential drinking water sources.	Applicable since ground water at Tank Farm Five is designated GA-NA.

TABLE C-4
FEDERAL ACTION-SPECIFIC ARARs AND TBCs
REMEDIAL DESIGN WORK PLAN
TANKS 53 AND 56, TANK FARM FIVE, NAVAL EDUCATION TRAINING CENTER

REQUIREMENT	STATUS	SYNOPSIS	APPLICABILITY TO SITE CONDITIONS
Hazardous and Solid Waste Amendments of 1984 (HSWA) Land Disposal Restrictions	To be determined	Prohibits placement of hazardous wastes in locations of vulnerable hydrogeology and lists certain wastes, which will be evaluated for prohibition by EPA under RCRA.	A residual sludge containing hazardous constituents will be generated from the coagulation/filtration treatment system. Analysis of the sludge will be required to determine how the material can be disposed. If the material fails TCLP analysis, Land Disposal Restrictions are potentially applicable.
RCRA (40 CFR 262) Generator Requirements for Manifesting Waste for Off-Site Disposal	To be determined	Standards for manifesting, making and recording off-site hazardous waste shipments for treatment/disposal.	This regulation will be applicable for the off-site disposal/treatment of the coagulation/filtration treatment system residual, if determined to be hazardous.
RCRA (40 CFR 263) Transporter Requirements for Off-Site Disposal	To be determined	Standards for transporters of hazardous waste materials.	This regulation will be applicable for the off-site disposal/treatment of the coagulation/filtration treatment system residual, if determined to be hazardous.
RCRA (40 CFR 264.10-264.18) Subpart B - General Facility Standards	Relevant and Appropriate	General requirements regarding waste analysis, security, training, inspections, and location applicable to a facility which stores, treats or disposes of hazardous wastes (a TSDF facility).	Because NETC was issued a Hazardous Waste Facility Permit by RIDEM in 1985, RCRA General Facility Standards are relevant and appropriate to interim remedial actions conducted at the facility.
RCRA (40 CFR 264.30-264.37) Subpart C - Preparedness and Prevention	Relevant and Appropriate	Requirements applicable to the design and operation, equipment, and communications associated with a TSDF facility, and to arrangements with local response departments.	Because NETC was issued a Hazardous Waste Facility Permit by RIDEM in 1985, RCRA Preparedness and Prevention Standards are relevant and appropriate to interim remedial actions conducted at the facility.

TABLE C-4
FEDERAL ACTION-SPECIFIC ARARs AND TBCs
REMEDIAL DESIGN WORK PLAN
TANKS 53 AND 56, TANK FARM FIVE, NAVAL EDUCATION TRAINING CENTER
(continued)

REQUIREMENT	STATUS	SYNOPSIS	APPLICABILITY TO SITE CONDITIONS
RCRA (40 CFR 264.50-264.56) Subpart D - Contingency Plan and Emergency Procedures	Relevant and Appropriate	Emergency planning procedures applicable to a TSDF facility.	Because NETC was issued a Hazardous Waste Facility Permit by RIDEM in 1985, RCRA Contingency Plan and Emergency Procedures are relevant and appropriate to interim remedial actions conducted at the facility.
RCRA (40 CFR 264.600-264.999) Subpart X - Miscellaneous Units	Relevant and Appropriate	Environmental performance standards, monitoring requirements and post-closure care requirements applicable to miscellaneous units (not otherwise defined in the RCRA regulations) used to treat, store or dispose of hazardous waste.	Because NETC was issued a Hazardous Waste Facility Permit by RIDEM in 1985, RCRA requirements for Miscellaneous Units are relevant and appropriate to interim remedial actions conducted at the facility.
RCRA (40 CFR 268) Land Disposal Restrictions	To be determined	Identifies hazardous wastes that are restricted from land disposal and sets treatment standards for restricted wastes.	A residual sludge containing hazardous constituents will be generated from the coagulation/filtration treatment system. Analysis of the sludge will be required to determine how the material can be disposed. If the material fails TCLP analysis, Land Disposal Restrictions are potentially applicable.
Clean Water Act (40 CFR 122-125) National Pollutant Discharge Elimination System (NPDES) Permit Requirements	To be determined	Permits contain applicable effluent standards (i.e., technology-based and/or water quality-based), monitoring requirements, and standards and special conditions for discharge.	This regulation will be applicable because treated ground water will be discharged to the Newport WWTP.

TABLE C-4
FEDERAL ACTION-SPECIFIC ARARs AND TBCs
REMEDIAL DESIGN WORK PLAN
TANKS 53 AND 56, TANK FARM FIVE, NAVAL EDUCATION TRAINING CENTER
(continued)

REQUIREMENT	STATUS	SYNOPSIS	APPLICABILITY TO SITE CONDITIONS
Clean Water Act (40 CFR 403) Discharge to Publicly- Owned Treatment Works (POTW)	Applicable	A national pretreatment program designed to protect municipal wastewater treatment plants and the environment from damage that may occur when hazardous, toxic or other non-domestic wastes are discharged into a sewer system.	This regulation is applicable since discharge will be to the Newport WWTP. The treated ground water will be required to meet discharge limitations established by the WWTP.
Hazardous Materials Transportation Act (49 CFR 170, 171) Rules for Transportation of Hazardous Materials	To be determined	Procedures for packaging, labelling, manifesting, and off-site transport of hazardous materials.	This regulation will be applicable for the off-site disposal/treatment of the coagulation/filtration treatment system residual, if determined to be hazardous.
Occupational Safety and Health Act (29 CFR 1904) Recordkeeping, Reporting and Related Regulations	Applicable	Outlines recordkeeping and reporting requirements.	Because hazardous substances are present at Tank Farm Five, OSHA regulations are applicable. These requirements will apply for all contractors/ subcontractors involved in hazardous activities.
Occupational Safety and Health Act (29 CFR 1910) General Industry Standards	Applicable	Establishes requirement for 40-hour training and medical surveillance of hazardous waste workers. Establishes Permissible Exposure Limits (PELs) for workers at hazardous waste operations and during emergency response.	Because hazardous substances are present at Tank Farm Five, OSHA regulations are applicable. These requirements will apply for all contractors/ subcontractors involved in hazardous activities. If PELs are exceeded during site activities, appropriate respiratory equipment will be worn.
Occupational Safety and Health Act (29 CFR 1926) Safety and Health Standards	Applicable	Regulations specify the type of safety equipment and procedures for site remediation/excavation.	Because hazardous substances are present at Tank Farm Five, OSHA regulations are applicable. During remedial activities, appropriate safety equipment will be kept on-site and a health and safety plan will be followed.

TABLE C-5
STATE ACTION-SPECIFIC ARARs AND TBCs
REMEDIAL DESIGN WORK PLAN
TANKS 53 AND 56, NAVAL EDUCATION TRAINING CENTER

REQUIREMENT	SYNOPSIS	SYNOPSIS	APPLICABILITY TO SITE CONDITIONS
RI Water Pollution Control Act			
RI Pollutant Discharge Elimination Systems (RIGL 46-12 et seq.)	Applicable	Permits contain applicable effluent standards (i.e., technology-based and/or water quality-based), monitoring requirements, and standards and special conditions for discharge.	This regulation will be applicable because treated ground water will be discharged to the Newport WWTP.
RI Pretreatment Regulations (RIGL 46-12 et seq.)	Applicable	Establishes rules concerning pretreatment of water prior to discharge to a Rhode Island POTW.	This regulation will be applicable because discharge will be to the Newport WWTP. Effluent levels established by the WWTP will be achieved prior to discharge.
RI Hazardous Waste Management Act of 1978 (RIGL 23-19.1 et seq.) Hazardous Waste Management	To be determined	Rules and regulations for hazardous waste generation, transportation, treatment, storage, and disposal.	These rules will be applicable for the off-site disposal/treatment of the coagulation/filtration treatment system residual, if determined to be hazardous.
RI Hazardous Substance Community Right to Know Act (RIGL, Title 23, Chapter 24.4) Public Right-to-Know Requirements	Applicable	Establishes rules for the public's right-to-know concerning hazardous waste storage and transportation.	These rules may be applicable for the off-site disposal/treatment of the coagulation/filtration treatment system residual, if determined to be hazardous. Documents applicable to remediation of ground water in the vicinity of Tanks 53 and 56 at Tank Farm Five will be available for public review.